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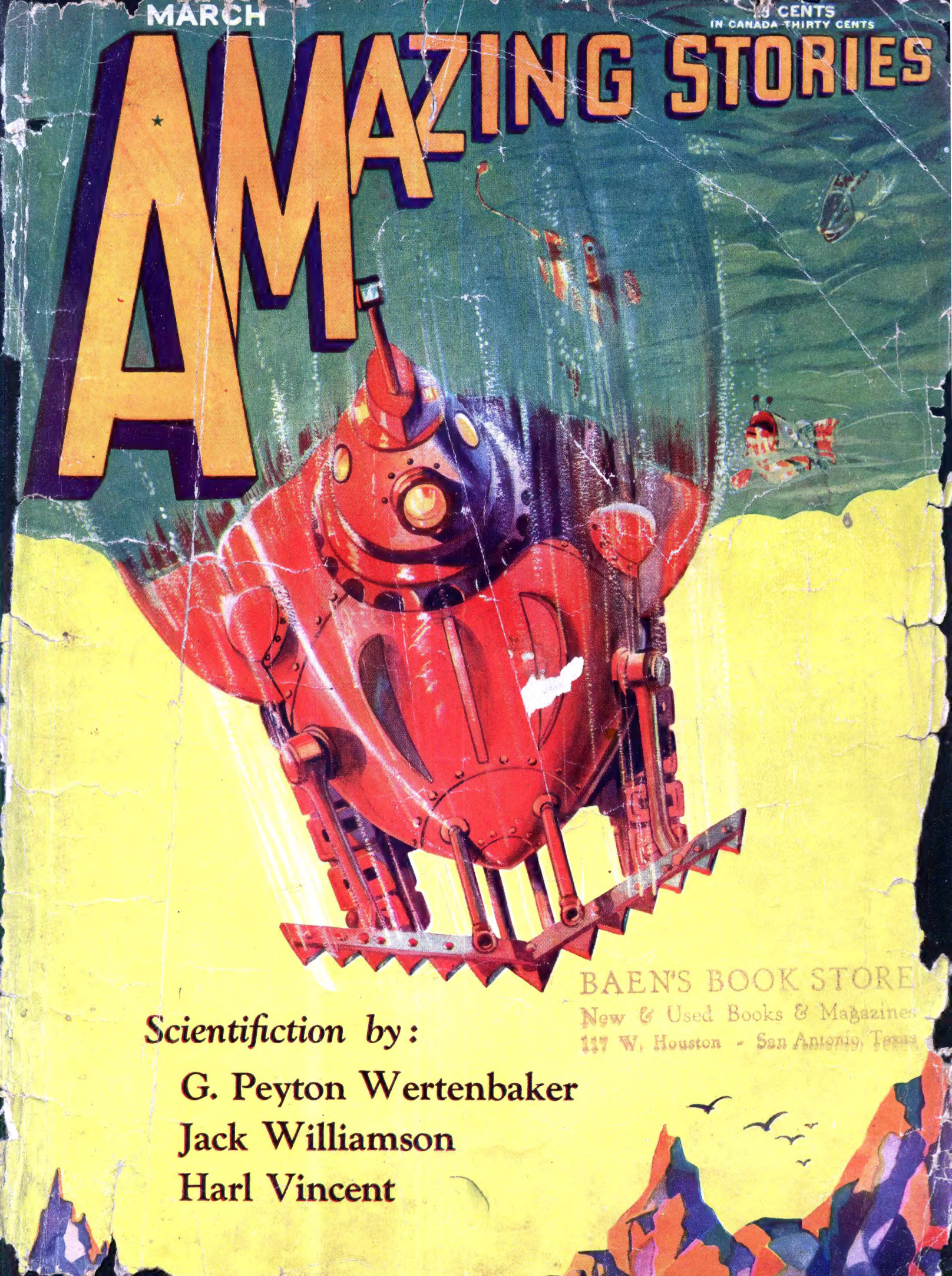

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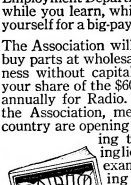

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AMAZING STORIES

March, 1930
Vol. 4, No. 12

Experimenter Publications, Inc.
B. A. Mackinnon, Pres. H. K. Fly, Vice Pres. and Treas.

In Our Next Issue:

REMOTE CONTROL, by Walter Kateley. Due to the decrease of our advertising, our extra 16 pages were discontinued, which in turn crowded this story out from this issue also.

THE GREEN GIRL (a serial in 2 parts), Part II, by Jack Williamson. In the concluding chapters of this classic the author continues the accelerating pace set in the first instalment. The only intelligence we know of now is that which is housed in the human body. But is it really necessary for intelligence to have only such a habitation? Why might it not just as easily send out its influence through some other force, about which we know nothing at the present time? It seems to us not only possible, but probable, that there is such a force somewhere and may even some day be discovered. "The Green Girl" will, we are sure, rank in your favor with a number of your favorites, among which we unhesitatingly mention "The Moon Pool" and "The Skylark of Space."

THE CONQUEST OF THE EARTH, by Isaac R. Nathanson. Although this story about an Andromedan invasion of the earth is by an author who is new to our readers, the story reads like an old favorite. Mr. Nathanson has not only made a careful check on his science, but he has the gift of fiction writing. And we know you will welcome the announcement that there will be more by him soon.

THE METAL HORDE, by John W. Campbell, Jr. Here is another interplanetary story by our young scientist author that is even better than his previous ones. We can leave it to Mr. Campbell to give us a unique tale, original in its conception and ingeniously worked out.

THE FEATHERED DETECTIVE, by A. Hyatt Verrill. Under this author's skilful handling this tale has an individuality that easily stands with the best scientific detective story. The green turacou and the change of color of its plumage when wet is a much debated subject among ornithologists. Mr. Verrill knows his subject. We feel no more need be said.

In Our March Issue:

The Green Girl
(A serial in 2 parts) Part I
By Jack Williamson..... 1110
Illustrated by Wesso

The Ship That Turned Aside
By G. Peyton Wertenbaker..... 1130
Illustrated by Morey

The Gostak and the Doshes
By Miles J. Breuer, M.D...... 1142
Illustrated by Morey

Callisto at War
By Harl Vincent..... 1150
Illustrated by Morey

Lanterns of God
By Robt. A. Wait..... 1168
Illustrated by Morey

The Mordant
By Merab Eberle..... 1181
Illustrated by Morey

What Do You Know?
(*Science Questionnaire*)..... 1185

Discussions..... 1186

In the Realm of Books
(*Mostly Scientific Fiction*)..... 1188

Our Cover

this month depicts a scene from Part I of the story entitled, "The Green Girl," by Jack Williamson, in which the ship, built by the hero scientist to move through air, on the surface of the ground and through water, with equal adaptability, is shown breaking through the overlying water at the bottom of a certain point of the Pacific to a city under the ocean. The city is enabled to keep the ocean as a roof by virtue of a gas, which the intelligences inhabiting this sub-sea city have invented.

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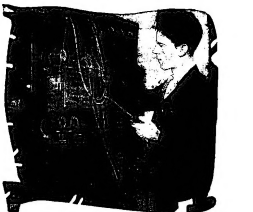

IF you are earning a penny less than $50 a week, send for my book of information on the opportunities in Radio. It's FREE. Clip the coupon NOW. A flood of gold is pouring into this new business, creating hundreds of big pay jobs. Why go along at $25, $30 or $45 a week when the good jobs in Radio pay $50, $75, and up to $250 a week. My book, "Rich Rewards in Radio," gives full information on these big jobs and explains how you can quickly become a Radio Expert through my easy, practical, home-study training.

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I'll give you just the training you need to get into the Radio business. My course fits you for all lines—manufacturing, selling, servicing sets, in business for yourself, operating on board ship or in a broadcasting station—and many others. I back up my training with a signed agreement to refund every penny of your money if, after completion, you are not satisfied with the course I give you.

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J. E. SMITH, President
Dept. OCS
National Radio Institute
Washington, D. C.

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4202 Arsenal St.
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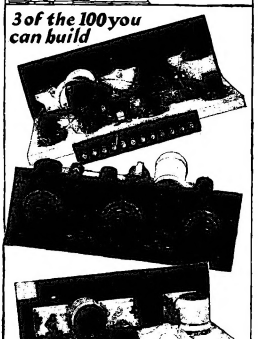
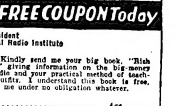
Frank M. Jones,
922 Guadalupe St.
San Angelo, Tex.

3 of the 100 you can build



Find out quick about this practical way to big pay



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Washington, D. C.

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VOLUME 4

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

MARCH, 1930 No. 12

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MIRIAM BOURNE, *Managing Editor*
WILBUR C. WHITEHEAD, *Literary Editor*
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Editorial and General Offices: 381 Fourth Avenue, New York, N. Y.

Extravagant Fiction Today - - - - - - - - - - Cold Fact Tomorrow

Propulsion and Acceleration in Interplanetary Travel

By T. O'Conor Sloane, Ph. D.

A VERY curious point comes up in the discussion of interplanetary traveling, that is of traveling through the almost complete vacuum of space. This is the power which would be required to propel a space ship, as it were, through space, when away from and out of the atmosphere of the earth. High resistance would be encountered in getting away from the earth due to the air. As long as the space ship, as we may call it, would be in the lower atmosphere of the earth at 10 or 15 pounds pressure to the square inch, a great resistance to its motion and to its acceleration would be imposed by the air. The overcoming of this resistance is the principal work of the airplane's or dirigible's engines. But if the ship, started vertically, or approximately so, from the surface of the earth, twenty miles of travel would get it rid of a very great part of the earth's atmosphere, and ten or fifteen miles more would virtually bring it into the vacuum of outer space. As soon as there would be no air to oppose its motion, very little power—hardly any, in fact—would be required to drive it ahead, without regard to its speed, provided this were constant. Acceleration and its rate would be resisted only by the mass of the body to be accelerated.

This resistance is due to what is called "inertia." Inertia, if we look up its etymological origin, may be translated as the "laziness of matter," for even in real life, especially in humanity, laziness is sometimes the deadest kind of resistance. The logical way to treat the subject would be to start our vehicle at a reasonably low, slightly accelerating velocity and to impose the real vigorous acceleration only when the vacuum of outer space would be reached and there was no air to oppose its motion, and to reach this place need not take but a few minutes. Here is the place where the so-called "ratiocination" of the Goddard rocket comes in. Out of the earth's atmosphere, and with practically nothing to contend with but the inertia of the mass of the object being propelled—and this only when accelerating—it would be found on calculation that an astonishingly small power would be required to accelerate and virtually no power to keep in motion a body of any mass in space.

In the physical sense, mass is a definite factor, and weight may be expressed as an accident. The mass of a body is a real thing; it is 1/32 part, approximately, of its weight. If the body were taken out into space far away from the earth, it would have no weight, but its mass would be unchanged. Mass divided by 2 and multiplied by the square of the velocity in feet per second gives us its inertia, its resistance to a cessation of motion. To impart a velocity of 100 feet per second to a three-ton object in space would require the exertion of about 1,000,000 foot-pounds. Coming back to our rocket: we certainly would feel that a rocket that was sent off in its flight by a maintained exertion of 20 horse-power would be a pretty big one. But, once it had attained its desired velocity and was in outer space, the strain that drags upon its power, a resistance produced by the presence of air would almost entirely cease, the horse-power could be reduced to almost nothing, and the least little evolution of gas through a nozzle—rocket fashion—would suffice to keep it in motion at high velocity. The whole problem, from a point of view of application of force and of the effect of change of motion upon the human system, resolves itself into this same problem of acceleration.

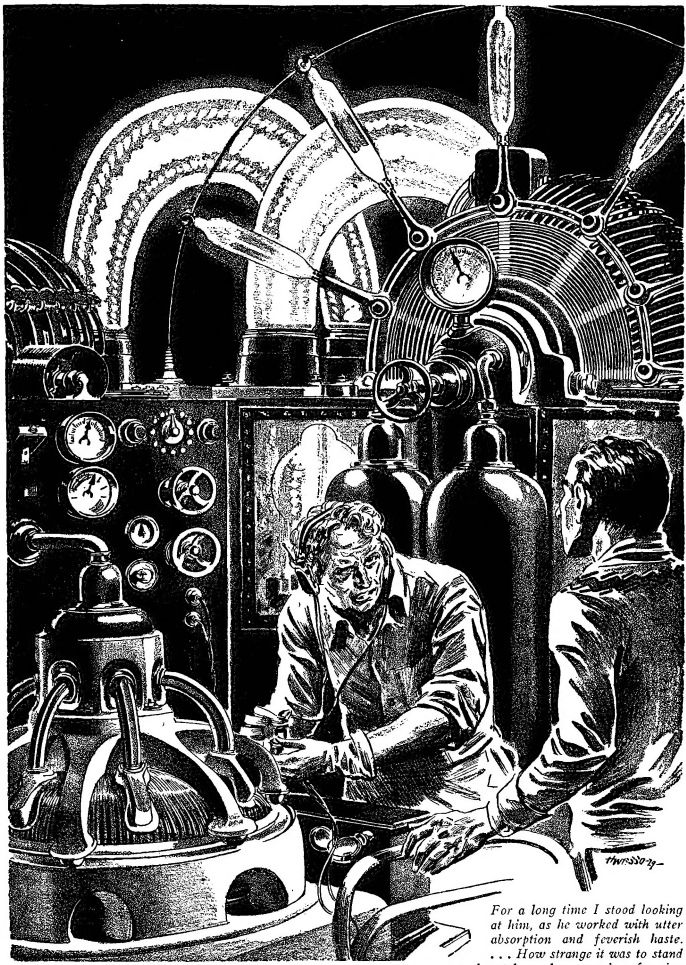
The personal element comes into very definite consideration. If the traveler were enclosed in a protecting cabin, high speed would not affect him. But acceleration will, and it must be limited or the results will be disastrous to the inmates of the vehicle. The chief medical examiner of pilots for the French air service is cited as stating specifically that it is acceleration not speed that is dangerous to air travelers. Too quick starting may mean death. The action of change of velocity upon the blood displaces it, throwing the circulatory system into disorder and forcing the blood into wrong distribution.

A speed of seventy miles an hour has been attained in one second of acceleration without injury, but it is believed that three or four times this rate would be injurious. The danger is emphasized by the fact that the pilot should be in perfect physical condition.

Duration of acceleration has a specific effect. If prolonged beyond three or four seconds, discomfort is liable to ensue, which is the warning of real trouble.

Another curious feature of high-speed traveling at a unifrom rate is that a sudden turn, generating what is called centrifugal force, produces an effect similar to that of acceleration. The blood is driven violently to one side or the other or in one or the other direction and blood vessels may be ruptured.

It is easy to believe that, with a highly responsive airplane under him, a pilot may be tempted to develop a high degree of acceleration. In the dirigible this is not so easy. By the use of some adequate material for the lining of the balloonets, the leakage is controlled. Goldbeater's skin was found to be an excellent material for the lining of the gas bags, but it seemed strange to go to nature for such material. Now efforts are being made to substitute some artificial substance for the lining for the gas bags of a balloon, instead of part of an ox's intestines. It is probable that very soon the artificial product will be developed. When this is brought about, the dirigible, which at least insures against too high acceleration, may begin to come into its own.



For a long time I stood looking at him, as he worked with utter absorption and feverish haste. . . . How strange it was to stand and watch one lone man in a freezing world struggling to save it!

The Green Girl

(A Serial in Two Parts) Part I

By

Jack Williamson

Illustrated by
WESSO

IN a very recent issue of SCIENCE AND INVENTION *Dr. Hartman tells of the amazing discoveries he has made in the Mediterranean, off the coast of Sicily, when he went below the sea in his newly constructed steel diving bell, which was designed to withstand a pressure of 2,500 pounds per square inch or a sub-sea depth of about 5,000 feet. During his latest venture below the sea level, Dr. Hartman discovered a prehistoric city—perhaps the Lost Atlantis. Why, then, should it be impossible to assume that there might be cities—even vast cities—submerged miles below the Pacific, for instance, and made habitable? But whatever else might be said, "The Green Girl" is a scientifiction classic that will rank with the best that have ever been published. Though it is a wild, exciting, fantastic tale, it is exceedingly plausible withal. Be sure to read the first instalment in this issue.*

CHAPTER I

MAY 4, 1999

AT high noon on May 4, 1999, the sun went out! It had risen bright and clear. The summer sky had had an unwonted liquid brilliance. The climbing day-star had shone all the morning with unusual intensity. But just at ten o'clock, an intangible mist obscured the sky! A pale and deepening film stole over the crystal infinity of the heavens! The sky assumed a dull, almost copper tinge, that developed into a ghastly scarlet pall! In five minutes the sky changed from a soft and limpid blue to an intense, darkling scarlet! In the appalling suggestion of blood in the dusky crimson depths, there was a grim omen of the fate of earth!

I had got up at dawn for a plunge in the surf, and all the morning I had been wandering about the bit of beach and the strip of virgin woodland behind it, content in the restful, soothing peace of that untouched bit of Nature, rejoicing lazily in the vivid greenness of it, in the fresh odors of earth and plant, in the whisper of the wind in the palms. I lounged on the crisp grass in the cooling shade, living in my sympathy with the life about me, watching the long soft rollers of the green-blue Atlantic surging deliberately toward the crystal whiteness of the sunlit sandy beach. The soft cerulian skies were clear, save for the white wings of occasional airships that glanced in the bright sunshine. The morning had a singularly quiet and soothing beauty. My sleepy soul was in harmony with the distant mellow chime of a church bell. I lay back in the peaceful rest of a man ready to sink lazily into the evening of life.

Though I am still an able man of somewhat less than thirty years, I felt that morning none of the energetic exuberance of youth. I felt something of the age and the agelessness of Nature herself. I felt no fires of ambition; I was oddly devoid of feeling or emotion; I felt content to steep my soul for eternities in Nature's simple wonders. But I have always been a dreamer.

I was a worshipper come unknowingly for the last time to the shrine of life. For even then the doom was gathering! But I was spared all knowledge of the alien menace that was blotting out the sun! I had no premonition that within a few short hours the balmy Florida coast would be a frozen wilderness, whipped with bitter winds and lashed with freezing seas!

I had risen at last, and was sauntering down the hard white sand in the direction of our cottage, listening idly to the birds—singing on the eve of their doom. I came in sight of the house, a low building, covered with climbing vines and half hidden in the trees. I strolled toward it upon the narrow, curving gravel walk, lost in the peace of the rustic setting.

The Doctor was sitting on the small veranda, gazing sleepily out over the sea, with his pipe in his mouth and his hands on the arms of his chair. Dr. Samuel Walden was the sole person in the world, outside the vivid creations of my dreams, for whom I had affection. He was an unusual character. Born in 1929, he was now seventy years of age. His earlier life had been devoted to science, and he had won fame and fortune for himself by the invention of the hydrodyne sub-atomic engine.

But in the last twenty years he had done no scientific work—or so I thought, for I had never been behind the little door that he kept always locked.

A close friend of my parents, he had been more than a father to me since they were lost in the turmoil of the last outbreak against the Council of Nations, when I was three years old. We had always lived in the old cottage on the hill, in this natural park on the Florida coast. He loved Nature deeply. For many years his chief interests in life had been plants and animals, for which he cared more than for society. A flower, a dog, the sound of the surf—such things were the joys of his life.

Though his hair had been white for many years, his lean, tanned face was unwrinkled, and he was among the strongest men of my acquaintance. In fact, two years before, he had won second place at the Olympic wrestling contests. He loved the simple things of life. He had a passion for cooking, and he made it a science as well as an art. He was an inveterate smoker, and clung to the habit, even when he had to have the tobacco smuggled in from Asia at vast expense. He had an old music box, of a type that went out of date half a century ago, to which he used to listen for hours on end.

There was little enough about Sam Walden's daily life to show that he was the greatest scientist of the earth, and the sole hope for the world in the amazing battle that was brewing. His simple philosophy had changed him far from the energetic young inventor of the hydrodyne. No one would have suspected the qualities of supreme heroism that he revealed.

During the days of my youth we had restlessly wandered over the globe. We had lived rather aimlessly—for the simple joy of living. The mountains, the desert, and the sea have always had a fascinating call for both of us, and we wandered in answer to that call—and during some of those years, I traveled on a strange quest of my own.

But it was a whole decade since we had left our rustic home. And as our latter years had been quiet and tranquil, so the world had lost the fierce energy and struggle for advancement, that had driven it during Sam's younger days. It had settled down to the enjoyment of peaceful content. Science had turned from the invention of new machines to the improvement of those in existence, and had died with their perfection, until, when the crisis came, Sam was the only man on earth able to understand and to cope with it!

The industrial organization had been perfected. Work was done by machines. Men attended them for short hours and played through long ones. There were no rich, and no poor. The products of industry were fairly divided. All men received their shares in content and enjoyed them to the full, without troubling themselves about the question of science or religion or of life that had received the attention of the past generation.

And upon the peaceful tranquillity of that happy, prosperous age, there fell with no warning the lurid doom that no man could explain, throwing it into frenzied confusion. In the past era, there would have been a thousand men to attack the problem, with all the power of clear, dynamic minds. Now, there was just *one man* who could understand!

It was not so much that scientific knowledge was lacking. Men still studied and talked the language of science. The machines demanded it. But there were none of trained and penetrating minds, used to departing boldly from the world of the known to bring forth the new. Science was no longer living. It was mechanical.

CHAPTER II

The Radio Girl

I HAVE said that I am a dreamer, living more truly in my fancy than in the world. Perhaps my imagination is abnormally developed. Always I have had new worlds awaiting me in my dreams, to which I could retire when life was dull or unattractive. My visions have always had a singular reality, such a definite concreteness, that it sometimes seemed to be the truth.

The old wonder stories of Wells and Verne, and of the pseudo-scientific writers of the first part of this century have always appealed to me. I had a vast collection of ancient volumes and tattered magazines, full of those old stories, which I read and reread with passionate interest. The rest of the world had forgotten them with the passing of the age of science, but I found in them the priceless food of fancy.

Psychologists say that many children have dream companions of some kind. They are very real entities of the child's imagination, playmates of fancy. They usually fade and are forgotten as the adolescent child becomes absorbed in the activities of life, and the imagination atrophies.

Since the days of my earliest recollections, I have visited in the world of my dreams a wonderful playmate. It is a girl, with dark brown hair, deep, warm violet eyes, and clear skin, so I thought, slightly tinged with green, though the lips were very red. I have always thought that she was very beautiful, and she has always been very real to me.

And the vision did not fade as the years went by! Still I visited the Green Girl, as I called her, in my fancy, and she replaced many of the normal childhood interests that I might have had. It is because of her that I have always been happiest when I was silent and alone, it is because of my dreams that I have been inclined to avoid the society of others.

The strange world of dreams in which I visited her was very real to me, a place of weird wonders, sometimes of alien terrors, in which the Green Girl and I wandered through interminable, astounding adventures. And I have always had an unaccountable persuasion that it was a real world, somewhere, through which my mind roamed in such delightful fancies!

It was twenty years ago, when I was just five years old, that the Green Girl first came into my dreams. Sam had rigged up, for my edification, an old fashioned radio set, with headphones. In the long, lonely silences of the warm Florida nights, when a less indulgent guardian would have had me in bed, I sat up with those old phones on my ears, exploring the ether, feeling near the infinite mystery of space. I listened with childish intentness to the odd noises of the static, eagerly dreaming of calls from other planets.

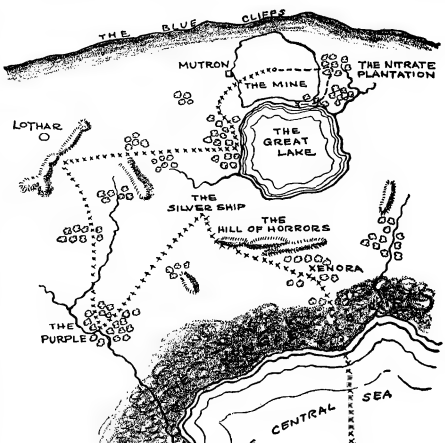
It was during one of those long still nights that I first entered that world of fancy, and found—the Green Girl! It seemed that I heard first a cry of delight in a silver voice, and then she was with me. She was but a tiny sprite, smaller than myself. She semed to stand before me, smiling at me, tossing her dark curls, with the light of bright intelligence in her blue-violet eyes. I loved her from the first. She was very beautiful. Her skin had just a tinge of green, like a tinted photo-

graph; it did not seem a strange color. The vision was very real to me.

When she spoke—and I half imagined her words were really coming over the ether—there was a childish lisp in her voice, but still a ring of confidence and courage. Her words were strange, but I soon grew to sense their meaning, almost by intuition. Night after night, when I put on the phones and tuned in on the strange noises of the ether, that vision came back. It was not long before I could speak that strange tongue as fluently as I could speak English.

With childish reserve, I told Sam nothing about my wonderful dream, until one day he heard me chattering in the language I had learned. He questioned me eagerly; and I shyly told him all about it, and even supplied material for a grammar of the language. He took a keen scientific interest in the matter, when he learned that the vision came only over the radio, and he began to formulate theories of telepathic suggestion and mind control by ether waves.

The matter was written up by a prominent psychologist to whom he reported it. The account appeared in a well known scientific magazine, with comments upon the strange language, which, oddly enough, bore not the slightest similarity to any known tongue, and appeared rather too perfect to be credited to the invention of a five-year-old. The writer mentioned Sam's ideas, that I had established telepathic contact with another planet, or perhaps with the far-distant past or future; but theories of mind reading received little welcome in a day when science was dormant, and even the suggestion that the language, because of its simplicity, power, and labial beauty, would become the long-sought international tongue, was soon completely forgotten.



The Map that Sam and Xenora Drew

But I did not forget the Green Girl. The conviction grew upon me that she was a real living entity. To find her became my ruling passion. Under Sam's tutelage I poured over geographical accounts, searching in vain for some clue to a hidden nation. But the fact that the language seemed to have no sister tongue on earth discouraged that. Between my tenth and fifteenth years Sam and I restlessly scoured the globe in search of a clue, but a decade before we had given it up.

I turned to dreams of interplanetary travel, with a passionate desire to explore space and venture to other worlds in search of my dream girl; but the space flier seemed as far in the future as it had done a hundred years before. To please me, however, Sam helped design and construct a model of a machine we called the Omnimobile—because it should be able to travel in all elements.

But, as the years of my early manhood passed, I slowly relinquished all hope of finding the Green Girl in fact, and resolved to content myself with her companionship in fancy. It was then, too, that I developed my inordinate fondness for scientific romances which I devoured insatiably to feed my dreams. It was only during the first few years that I could find her only over the radio. As time went by, she became an inseparable companion of my mind.

Once, for a time, I tried to lose myself in science. I had Sam teach me chemistry, but that could not replace my dreams.

Together, the Green Girl and I went through ten thousand fantastic adventures. It was as if our two minds met in the world of dreams jointly created by both of us. Certainly it was influenced by the incidents of my life, and by the wonder tales I read. And the girl told me stories, strange and thrilling narratives they were, of mythical heroes of her race that struggled with weird terrors.

She grew up with myself, until she became a princess of incomparable beauty. Often I have wished that I were a gifted painter, that I might have tried to record her charms, but even if I had been such, her perfection would have discouraged my efforts. She was slender, erect, combining an unconscious dignity of poise with vivacious spriteliness of manner. Her hair was soft and curly and brown. Her pale green skin was very soft; her full lips very red. And her sparkling violet eyes were clear and honest—bright wells of human sympathy.

Could I believe that such a supernal being was merely a dream?

CHAPTER III

The Scarlet Pall

THE coming of the terror was slow and gradual enough—and as silent as the tomb! With all the magic of the quiet woodland beauty throbbing in my being, I was strolling up the narrow gravel walk toward the peaceful vine-covered cottage, where Sam was sitting in sleepy content. Gazing idly into the measureless infinity of the liquid azure sky, I saw the beginning come, so slowly that I scarcely marked it!

A pale rosy mist seemed suddenly to condense in the sky! A ubiquitous crimson haze was born from nowhere! Even as I stood in open-mouthed amazement—with the sudden chill of alien terror grasping my limbs and tugging at my heart—the hue of the sky ran quickly from the pure deep blue to an intense and awful scarlet! It was deeper than the crimson of sunset—it had a terrible, bloody intensity! It was as if a spray of blood from the arteries of some dying monster had abruptly encrimsoned the sky!

A fearful, blood-red twilight fell swiftly upon the tranquil beauty of the scene before me, painting it with hues of weird and gruesome horror! The once blue sea rolled in like a tide of blood, flashing a million gleams of awful crimson light, as the red sun was reflected on its waves! Familiar objects took on dreadful forms of wild foreboding, in that suddenly ghastly gloom of red!

And that was but the beginning!

The Unknown is always terrible, and if ever the earth was menaced with an unfamiliar threat, it was that scarlet pall. For a moment I was gripped fast by the surprise, and the chilling, alien fear of it. Then my reason reasserted itself, and I hurried on toward the cottage, trying to convince myself that my dread was unfounded.

I knew, of course, that red light penetrated clouds much better than other colors. I knew that the red light of a neon beacon is visible through miles of mist. I knew that the sun looks red on a murky day, because all but the red rays are absorbed by the atmosphere. I had an idea that a cloud had suddenly come between earth and sun, perhaps a haze of meteoric dust. But I failed to reassure myself.

With a glance at the sun, which was gleaming at the zenith like a great red moon, I stepped upon the veranda, still feeling a slight weakness about the knees. Sam had risen to his feet. He stood gazing silently and blankly out to the eastern horizon, where the flaming intensity of the encrimsoned sky met the glancing brilliant beams from the darkened sea. There was no surprise in his expression, and little of fear—merely pain and despair.

"What is it, Sam?" I asked quickly.

He looked around slowly. "I don't know what it is, Mel, but it means the end of the earth! I've known for years that it was coming, but I hoped it wouldn't be so soon."

"You knew that this was coming! And you didn't tell anybody! Not even me!"

"It would have done no good. What would be the benefit to mankind to know that it was doomed to die like rats in a trap? A few more years, and I might have been ready to save the earth. As it is, there's just a chance—a bare chance!"

"But what does it mean? It's uncanny!"

He sat down again, wearily. There were lines of age and care on his lean face that I had never seen before. But even in the dull red light, there was still energy and determination in it.

"I've never told you, Mel, but ever since the radio brought you your dream of the Green Girl, I have been working—building delicate apparatus and exploring the ether. And I found a strange force at work—a force that is battling to control the ether! For fifteen years I have known that it was working *to freeze the earth!*"

"To freeze the earth!"

"It seems so. What it is is a mystery, whose solution has resisted all my efforts. I can hardly conceive a reason for it. But I know that something is at work to cut us off from the sun! You know that light waves of different phases and the same frequency interfere, with mutual extinction—the diffraction grating is based on that fact. And interfering waves have been setting up such a disturbance in the ether about the earth as will ultimately cut off the sun's radiation! The principles of it are a bit abstruse. Even now, of course, the effect is only partially complete. In fact, the red and infra-red rays carry most of the sun's heat."

"Then there's no immediate danger?"

"No man knows at what moment the force may be synchronized. When it is, within a short time the temperature of the earth will fall to absolute zero. And even as it is, life could not go on long under this red pall, for all life depends upon the actinic rays in the ultra-violet spectrum."

"And you have kept a thing like this to yourself for years!"

"It would have done the world no good to know that any day might be its last. I have spared no efforts to find means of averting the catastrophe. And it has been terrible to know. Every day that I have walked among our trees, or listened to the birds, or watched the wonder of the sea, I have known that in a day it might all be frozen death!"

"But you say there is a chance? There's something you can do to save the earth?"

"I've built a machine to broadcast vibrations to interfere with that other force. It will upset it—I hope!—for perhaps a few days. But think, Mel, what it means! Think of the vastness of the power that would be able to cut off the sun! Earth—mankind—would mean nothing to it! It would soon get around my interference! I must save my machine for the last emergency!"

CHAPTER IV

The Amazing Night

THE only difference between red and blue light is that the waves of the red are about twice as long as the others. There must have been a sort of screen in the ether that somehow intercepted all but a narrow band of frequencies in the red, the other wave-lengths being either canceled or converted into vibrations too long or too short to be perceptible. If there was such a screen, it was slowly altered, so that the lengths of the penetrating waves became shorter and shorter.

In other words, the color of the sky slowly ran through all the colors of the spectrum toward the blue! The sun changed from a vast round blood-ruby to a blazing yellow diamond, flooding the earth with a sodium light! To an emerald, huge and supernally bright, coloring the sea and the sky with a dim and ghastly green radiance! The green melted into a cold and awful blue! The frozen sapphire slowly turned violet! And the violet sun grew soft and dim—and dim—until it went out utterly!

The heavens were black at midday!

The sky was an empty, illimitable chasm of darkness! The night was almost tangible—it seemed to have an oppressive weight. It was blacker than any photographer's darkroom. Trees, cottage, sounding sea, had vanished! It made no difference to close my eyes, or to put my hand before them. A great dizziness came over me, and I groped blindly for the post of the veranda, and clung to it helplessly when I found it.

The sounds that came to me were oddly reassuring. The rustle of the wind in the palms, and the plaintive chirp of a few birds in the unseen trees, and the dull, ceaseless rumble of the waves. Then I heard a heavy sigh from Sam, and the scraping of his shoe on the floor. Then a match scratched, and a pitiful little yellow flame lit the veranda, showing Sam's lean, earnest face very clearly against the wall of night.

"Thank God we can see it burn!" he muttered. "If they had exhausted the ether here, the jig would have been up with my electrical machinery."

"They! Lord! Do you think somebody—"

He looked toward me, holding up the blazing splinter. "There is the possibility—even a probability—that we have to deal with a force directed by intelligence!"

"Who do you think—"

"I didn't say human intelligence."

"You mean Mars or—"

He grinned in the feeble light. "No. Nothing out of your stories. The human imagination is limited by human experience. And there are plenty of things possible that human beings have never experienced!"

"What do you mean, Sam?" I gasped in utter bewilderment.

"I don't know what it is that is attacking the earth. Possibly it is something so strange, so alien to my purely human experience that it would wreck my mind to know!" Abruptly he turned toward the door. "I must go in and get to work on the machine."

The match had burned out, and the utter blackness had fallen again. I heard the old scientist get briskly to his feet and walk into the house. He reached the light button, and the hall was flooded with cold white radiance. The bright, slender beam thrown out across the veranda comforted me immensely; but I still stood against the post, trying vainly to think out what Sam had said.

The breeze grew cooler. In ten minutes a thin cold wind sprang up from the north. I drew my light garments close about my body and shivered a little. For a while I did not go in. Presently I felt a cold mist on the wind. Suddenly a snowflake splashed chillingly against my face—an omen of the frigid doom that lay before the earth! I got up and stepped inside the door, to escape the icy wind. In a few minutes it began to rain, because, of course, of the chilling of the air and condensation of the moisture.

Suddenly curious about how the world was taking the weird catastrophe, and about what was happening elsewhere, I went to the radiophone in the living room, and switched it on. Not a sound came from it! Not even a hint of static! The ether was utterly dead! That meant that the strange force had already cut our civilization up into a thousand helplessly isolated units!

Then from the rear of the building I heard the peculiar rhythmic throbbing beat of a hydrodyne power generator. Sam was already at work in the little room he had always kept locked, even against me. I walked back to the door and knocked, asking to be allowed to come in.

Sam called out for me to enter, and I stepped inside. I stopped at the door in amazement. The little space was crowded with intricate electrical apparatus of modern design—in fact, much of it was new and unfamiliar to me. There were intra-atomic power generators, huge electron tubes, coils, switches, loop antennæ, and a wealth of other material that was strange to me. I saw at once that the laboratory before me must have represented vast sums of money and years of toil.

Sam, clad in a pair of greasy overalls, with a great smudge of grease already over half his lean face, was working intently over a huge complex device in the center of the room. Evidently it had been recently and hastily assembled from the materials at hand, and was not yet quite finished. In fact, a desk by the wall was still littered with the plans and calculations from which it had been set up.

It was evidently founded on an adaptation of Sam's great invention of forty years before, the hydrodyne sub-atomic engine. The hydrodyne is based in principle on the catacytic disruption, by means of a radioactive salt, of water, the products being hydrogen and oxygen gases, which are burned in the cylinders, the steam formed being condensed and pumped back into the coils. The actual energy comes from the disintegration of hydrogen atoms, and the efficiency of the device is shown by the fact that the great generators on the transoceanic aerial liners require only a half pint of water as fuel per trip.

At one end of Sam's new machine was the hydrodyne unit. From the size of the catalyzer coil, it must have been of vast capacity. The conduits led to the transformer coils, and above the coils were the giant electron tubes, six feet high, of a novel, horseshoe shape. Sam was working with deft fingers at the connections.

"It will be hours, yet," he said absently, without looking up.

For a long time I stood looking at him, as he worked with utter absorption and feverish haste. There was nothing I could do to help him—I could hardly understand what he was about. How strange it was to stand there in a freezing world and watch one lone man struggling to save it!

The cold rain was drumming heavily on the roof, and the roar of the sea had risen. The wind was blowing a gale, but there was no lightning in the storm that night. The out-of-doors was as dark as Erebus. Presently it grew cold in the room. I went out and shut the doors, and turned on the resistance heaters. Then I made a cup of coffee and brought it to Sam. He gulped it down absently, and went on without a word. I went back to my chair by the wall, and I think I must have fallen asleep.

CHAPTER V

The Etheric Storm

THE next thing I knew, Sam was shaking my shoulder. I sat up, rubbing my eyes, a bit dazed at first, and uncertain whether I could credit what I remembered to be a vivid nightmare. But when I looked at the utter fatigue and the intense anxiety on the old scientist's face, I knew that it was not a dream.

"I've got it adjusted now," he said. "Suppose you go outside and watch. We need to know exactly what happens. And it may fail."

As I got up awkwardly, stretching my tired limbs, he climbed on his stool before the complex array of instruments on the wall, and began to manipulate the switches and dials.

"I have just to pick up their vibrations and synchronize mine with them," he said in a voice dull with fatigue. "In five minutes we will know. With these instruments I can pick up and analyze any disturbance in the ether, whether it be Hertzian or wireless wave two miles long, or any of the shorter waves that extend down to heat or infra-red, through the visible and ultra-violet spectrums, and even below, to the Cosmic Rays. I can pick up vibrations that other scientists have merely reasoned ought to exist! I will analyze the force that is being used, and then put my vibrations against it. I hope to set up an effective interference, temporarily, at least."

In two minutes I was standing out of doors, with a rug about my shoulders, in a blackness that was almost palpable. The bitter wind still blew a little, but the rain had stopped. The ground was frozen, and a light fall of snow crunched underfoot. Drawing the rug close about me, I groped my shivering way to the front of the yard, thinking of the misery and death that the cold must already have brought to earth, realizing, for the first time, how dependent human welfare is on the whims of nature.

For a few minutes I waited in the frozen darkness, and nothing happened. Then began a fantastic thing, a veritable storm in the ether!

A faint living light of violet—blessed dawn of reborn day!—came in the south; thin misty streamers of violet flame flashed through the unutterable midnight of the heavens! Violet fire flickered and burned in a pale and nebulous aurora that ran with lightning speed to the four corners of the heavens! It danced, it wavered, it marched in gleaming pointed lances of pulsing flame!

And then the violet became a ubiquitous lucent background for a weirdly glorious and terrible play of bright, coruscating tongues of polychromatic fire! Suddenly a great blade of vivid, flaming green cut through the glowing violet, flashed across the sky in amazing splendor, and burst into a hundred blazing globes of brilliant emerald, that rolled down misty tracks of flame to the horizon!

A flickering, many-tongued sheet of amber was born in the east, spread over the violet haze throughout the heavens, and died into a pale saffron sheet that slowly changed and warmed to a rich glow of rosy mist. And from it grew a flickering wall of serpent tongues of orange, and scarlet, and blue, that danced and spread, and wove themselves into a curious crown of throbbing flame at the zenith.

All that wild and astounding storm of flame was as still as the grave. The chill wind had died. The air was keen and quiet. The snow-covered earth lay vast about me, queerly lit by the changing colors in the sky. Even the sea was silent, but living in the wonder of reflected light. All the world was quiet—as if the sun had been utterly gone, and it had been frozen indeed!

Brighter scarlet and green and purple lights burst up about the horizon in great fountains of wonderful fire, and poured through the sky in cyclonic whirls of burning splendor! It was like some vast pyrotechnic display; but the fire filled the heavens, and shone with incredibly splendid, living radiance, of every color in the spectrum—the pure and dripping essence of molten light!

Thin, feathery tongues of soft prismatic colors, great bars of intense and vivid fire, huge and rippling sheets of blinding brilliance, vast globes and vague shapes of bright and mist-edged flame, all interwoven in a Titanic storm of throbbing, flashing, iridescent light—a whirlwind of coruscating flame, splendid as a cascade of rubies and diamonds sweeping down in a sunlit stream of molten gold! A pulsing mist of woven flaming rainbows!

And suddenly there came a spot of pure, supernal blue at the zenith! Wonderful sight! It spread in a growing circle of blessed light! In a moment the last faint tinge of crimson fire was fading on the northern horizon! The skies were blue again!

The sun was far past the meridian! It had been hidden thirty hours! Its clear warm rays poured over the snow-clad landscape, sparkling in white brilliance on the frost and dancing on the silent sea. It was wonderful to see the world again in daylight, to feel the genial warmth of the restored sun!

Sam had won! He had torn down the curtains in the ether, and lit the sun again!

I went back in the house and found him slumped down in a chair fast asleep, with the vestiges of a happy smile left on his face. I had not realized the strain he had been under. He had been driving himself for thirty hours like a high-speed machine. The intensity of the effort had exhausted him utterly. He did not wake up while I was putting him to bed.

In an hour the radio had come to life. The ether was buzzing like an angry beehive with reports of the catastrophe, and with mad speculations as to its cause. The red gloom, followed by the absolute darkness, had fallen simultaneously upon the entire earth. All lines of power and communication had been put out of order, as in a severe magnetic storm, and utter panic had gripped the world. Every man had fancied himself to be among the few survivors of an unthinkable catastrophe.

A blanket of cold had fallen upon all the earth. In many sections there had been torrential rains as the clouds condensed, and there was considerable loss of life due to flood. In certain sections there had been terrible blizzards, and thousands had been frozen to death. Vast damage had been done to young crops, and there was a threat of famine. But, in most places, enough radiation to cause freezing weather had been prevented by the dense clouds.

Varied and fantastic theories were advanced as to the cause of the unique phenomenon. The most popular explanation was that the solar system had passed

through a small, dense nebula, the particles and condensing gases of which had intercepted solar radiation.

Sam's brief statement, advanced a few days later, that he had found the disturbance to be due to a strange force acting to erect an etheric screen or shell about the earth, through which vibration could not pass, received scant attention despite his scientific reputation; and his warning that it might return again at any time, and forever, passed unheeded. He made no mention of what he had done to save the earth.

CHAPTER VI

The Omnimobile

I NOW come to the Omnimobile, the machine that Sam had designed with a view to use in interplanetary navigation. He had worked on it, of course, more to please me than for any other reason; and we both knew that there was little chance of the machine's being able to make a successful voyage through space.

On the day after the sun had been restored, Sam was back in his laboratory, still feeling out the strange forces in the ether, and trying to anticipate the next attack. I was wandering along the beach, rejoicing in the bright warmth of the sun, absorbing the spell of the wood and the sea and the fresh salty air, regretting that all of it might be frozen again. There an idea came abruptly to me.

Why not build the Omnimobile?

Designed to withstand the bitter cold and the absolute vacuum of space, planned to survive the shock of landing on frozen worlds, equipped to traverse the terrible mountains of the moon, to crawl over the burned deserts of Mars, or to explore the vast seas of Venus—even if it would not be able actually to leave the earth, might it not preserve our lives when the frozen night came again?

A bitter existence it might seem, to spend one's years shut up in a metal cylinder, in a dark and frozen world, traveling, perhaps, in absolute night, over still, unseen cities of the dead. But I had my books—and the Green Girl! I could live on with that wonderful princess of my dreams, and forget the doom of my kind! It seemed selfish to think of it—but my love of the Green Girl was so great that I would have given my all for her, even to dream of her!

When I reached the cottage I spoke to Sam of my idea, and he agreed with an alacrity that surprised me. We tested the little model again, and he made revisions and alterations in the design. In a few days we began construction on the beach two hundred yards below the cottage. There was no lack of funds, and we pushed the work with all speed. We had a hundred workmen on the spot, and shops all over the country were busy turning out the parts and instruments which were rushed to us by air. I superintended the work myself, since Sam still spent most of his time in the little laboratory, working with that mysterious force.

The Omnimobile, conceived and designed by Sam, would have been worthy of a Jules Verne's creative mind, and the great adventure into which it led us was far more weirdly amazing than any of those old wonder tales to which I had so passionately devoted myself. Without the hydrodyne, and a dozen other inventions of Sam's, the machine would have been impossible. Certainly it merited the name Omnimobile, for it was hard to imagine a place to which it would not be able to go.

The vessel was of a tapering cylindrical shape, ten feet in central diameter, and forty-five feet long. The construction throughout was of the strongest modern alloys of aluminum and beryllium. The hull was ingeniously braced to enable it to withstand tremendous shocks or immense pressure. The ship carried an equipment of hydrodyne generators totalling more than five hundred thousand horse-power—an absurdly large power plant, it seemed to me.

The machine had caterpillar tread for travel overland or over the ocean floor, screws for propulsion over the water, vanes and rudders for diving, and another more unusual feature—rocket tubes to drive it through air or through empty space! They were of Sam's invention, and of novel design. They were loaded with water, and contained resistance coils through which a tremendous current could be sent from the generators, heating the special metal tubes to a temperature of some thousands of degrees, and converting the water into superheated steam at enormous pressure, which, escaping at the nozzles, would propel the ship by reaction.

According to Sam's figures, the machine should be able to hurl itself a hundred miles in ten minutes, but it seemed very unlikely that it would ever be able to develop the speed of seven miles per second required to get clear of the earth's gravitation.

Amidships, above the control cabin, was a low revolving turret, or conning-tower, containing a second instrument board, so that the machine could be driven either from there or from below. It carried not only periscopes and other instruments, but a two-inch automatic cannon, of a recent design, capable of firing gas, shrapnel, or high-explosive shells at the rate of two hundred and twenty per minute. There was a small torpedo tube forward; and, as a further addition to the armament, Sam had installed transformer and projectors for using the half million horse power of the generators to produce a vast electric arc.

Arrangements for the life and comfort of the passengers were not lacking. There were oxygen tanks and caustic potash containers to purify the air. The walls were provided with heat insulation, and the temperature was automatically controlled by electricity. The control room below the conning-tower, with the instruments at one end, was fitted up like a luxurious little library. Forward was the tiny galley and dining room, aft, a miniature stateroom. The remarkably compact generators and machinery were in a compartment in the stern. There was a space in the bow for supplies of concentrated food, spare parts for the machinery, arms and ammunitions, and miscellaneous supplies.

So fast did the building proceed that, within three months after the day of darkness, the last plane of the construction fleet was gone. We began to supply the vessel at once. Sam selected the foodstuff, and had enough put on board to last us for many years. We had a supply of ammunition for the machine gun, and an assortment of rifles and pistols. Sam had a little corner fitted up for a laboratory, and stocked with instruments and apparatus of all varieties. In the cabin I put the better part of my collection of the old ro-

mances. We were preparing a little world of our own, getting ready to be cut off from civilization, forever!

Last of all, Sam set up on board of our craft the great machine with which he had battled the strange force in the ether to bring back the sun. He had not given up. I knew that, even if he saw no hope, he would not surrender so long as he lived. He would carry on the war to the end.

As it stood on the beach below the cottage, the Omnimobile was a strange-looking machine. Gleaming like silver in the bright sunshine of those last days, it looked like a vast metal monster. It was bulky, almost clumsy looking; but it had somehow the air of an irresistible strength that could force a way through forests and surmount mountain peaks. In its resistless power, it suggested the old saurian lords of the jungle. With its low, thick body, and the massive strength of its construction, there seemed little doubt that it might go almost anywhere it chose, and be able to take care of itself upon arrival.

The last day came. For two weeks we had been ready to move aboard whenever the alien force brought the frozen night again to earth. I had been living in it, while Sam spent most of his time in the laboratory. I whiled the time away by wandering on the beach, bathing in the surf, or dreaming idly. I tried to believe I did not care too much. I tried to think I could go on serenely, the last man alive, forgetting the dead earth—happy in my dreams of the Green Girl!

CHAPTER VII

The Globe of Crimson Doom

FOR some time I had felt that Sam was afraid of something, of a danger more personal than the freezing of the earth. He had said little about it, but from his hints I gathered that he thought the mysterious force he was struggling against might do something to sweep him and his machine out of the way. He spent hours alone in the little room, with the apparatus that registered new force in the ether, manipulating his switches and dials, with the phones on his ears, and his eyes fixed on the color screen, listening and watching intently—for what?

There was no man on earth with enough knowledge of science to follow him. None could have understood his explanations, even if he had given them. So the world will never know.

It was just after sunset that the amazing thing took place that showed the full power and alertness of the incredible force that menaced the earth. I was sitting in a folding chair on the narrow white metal deck of the machine, leaning back against the squat conning-tower, with the black muzzle of the little gun sticking out over my head. I had a book in my hand, but it was closed, and I was gazing out at the sea.

Sam was still at the house, although it was past our usual supper time. Suddenly my attention was attracted by a faint hail. I glanced toward the cottage and saw him running toward me at a desperate pace, head down and legs working like pistons.

Though I was unable to imagine what the matter might be, I got up, opened the hatch, carried down my chair and started the motors, in case he might want to move the machine. In a moment I heard him scrambling up the ladder at the side, heard his quick footsteps across the deck. He dived into the room, shouting breathlessly, "It's coming! Quick! Start—"

Before I could move, he had brushed me from the instrument board. The heavy throbbing drone of the hydrodyne units rose higher, and in an instant the Omnimobile had lunged forward, with a great rattle and clanking of metal, so suddenly that I fell against the wall.

I was amazed at the speed we developed. Sam was not sparing the machinery. The clanging roar was almost deafening. The whole machine vibrated to the engine beat, and it rolled and tossed so much that I could hardly recover my feet. With face set and expressionless, with blue eyes straight ahead, Sam stood with his hands on the levers.

He went straight up the beach, without regard for trees or fences. Suddenly he swung the wheel about in a wild attempt to avoid a shelving declivity that led down to the water. Our speed was too great. Momentum carried us on. The machine rolled over completely, tossing me about the padded conning-tower like a doll. When I got up again the invincible machine was still forging on, with Sam undisturbed at the controls.

We were two miles from the cottage when he brought the Omnimobile to a standstill on the hard white sand a hundred yards above the water, and turned off the engines. With a sigh of relief he turned to face me, pulling out a red bandanna to wipe the beads of sweat from his brow. He grinned faintly.

"Rather a narrow squeak, that! I was not looking for it—so soon. We were just in time; I thought they had us!"

"But what—what is it?" I stammered, still seeing no cause for our mad flight, though I had no doubt there had been cause enough. "Who—"

"Wait and see," Sam suggested grimly. "I hadn't imagined they could do such a thing! I just happened to pick up the warning in time. Mel, the thing we're fighting must be a million years ahead of us! I never dreamed of such a thing!"

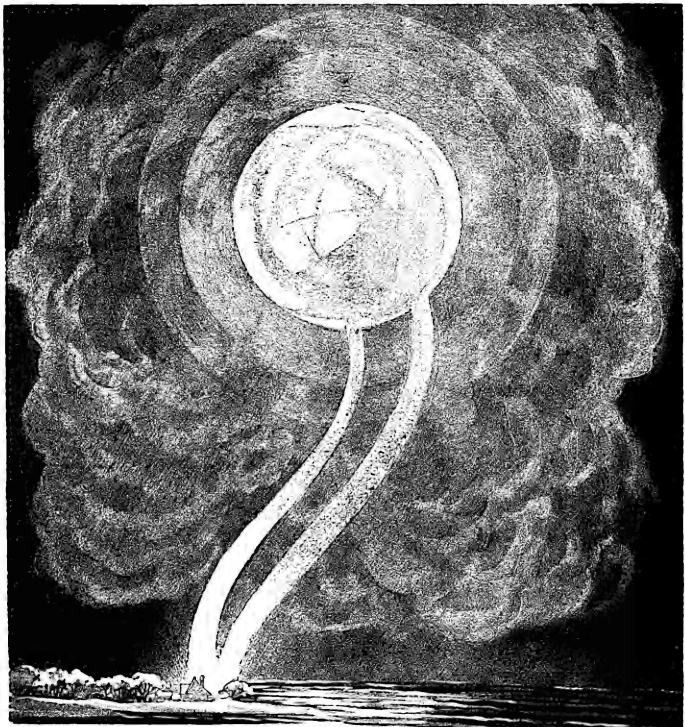
I looked out through the thick lenticular windows of the conning-tower, but failed to see anything unusual.

"Get your binoculars and we'll go on deck," Sam said. "I'm sure we're out of danger here."

I was not so sure about that, but I got the heavy glasses, and we stepped out on the metal deck. I looked back in the direction of the place whence we had come. The world was very still. Even the sea was almost silent. The old cottage on the hill behind us seemed suddenly very desolate and lonely, standing out, a solitary dark point, against the dying glow of the westward sky. It seemed very bleak and ancient.

And then I saw a curious thing—an astonishing thing. There was something *bright* hanging in the air a hundred yards above the building—something that shone with a silvery gleam! Steadily it grew brighter against the dull, somber curtain of the darkling western sky. Then I saw that it was a huge globe of white, metallic light. It was a great gleaming silver ball, evidently many feet in diameter! It glowed with a queer, unnatural effulgence! It was like a little floating moon!

In a moment I saw that a faint greenish haze was gathering about it. With astonishing swiftness a veil of glowing green mist was drawn about the sphere of shining white. It became a vast luminous green cloud that swirled and shifted in thin feathery streamers, drawn



In a moment I noticed a change. The seething clouds of green were sucked down. They drew into a dense cyclone vortex of flame about the old house

around the shining central globe. It swam, and swirled, and grew! It wheeled madly, dizzily, ever reaching out. It was a mist of flame like the photosphere about the sun. A strange, weird light shone from it, lighting the sea and the beach and the woodland about the doomed building with an uncanny radiance!

Quite abruptly two narrow beams of a thick, misty purple fire darted out of the silver core of the amazing thing, and, flashing over the ground, fixed themselves upon the cottage! They were like thin, unpleasant fingers of purple fog! There was something terrible in the swift sureness of their motions! They moved as if they were seeing eyes, or tentacles—feeling, searching!

Suddenly they were gone. In a moment I noted a change. The seething clouds of green were sucked down. They drew into a dense cyclonic vortex of flame about the old house, like a falling torrent of molten emerald. The building was half hidden in the thick, racing fog. I strained my ears, but not a sound did I hear, save the soft whisper of the sea. The cloak of green mist swirled about its core with a silence that was complete—and terrible!

Suddenly the ancient house burst into strange red incandescence. The chimney, gables and corners shone with a dull, lurid scarlet fire. There was no flame, just a dusky, crimson gleam! It grew brighter and deeper, until it was an intense, bloody glare. And then the climbing vines and trees about it, gleaming like ruby plants, began to melt away! The house began to dissolve into crimson light!

The green mist swirled lower. The silvery central moon waxed brighter. Once or twice thin fingers of purple mist were again thrust out exploringly, all in a silence of death. And the red gleam grew! The house glowed as though washed in a rain of blood. And swiftly it faded into that awful light!

The chimney tottered and came down in a shower of red sparks that faded into nothingness before they touched the ground. The roof fell, and the remnant of the walls collapsed upon it in a heap of crimson dust of fire that faded swiftly—dissolved—vanished!

The little hill was a bare red waste, gleaming with that terrible scarlet glare. The two purple tentacles of misty flame shot out again, and swept searchingly over the spot. Suddenly the green mist stopped its seething motion. Its fires died out. It grew dim, faded, was gone like a cloud of dissipating steam. The white glow of the silver globe waxed dull, and suddenly it, too, was no more.

Quickly the red glow faded from the weirdly denuded hilltop, and the night fell in a heavy mantle. I stood wrapt in a spell of amazement and terror.

CHAPTER VIII

Out of the Sea's Abyss

"WELL, how was the show?" Sam's voice was a little weak and strained. Suddenly I was conscious of an unpleasant tremor of the knees. I went into the conning-tower and dropped myself weakly on a seat. I tried to speak, but my mouth was very dry. I swallowed twice.

"What was it?" I contrived to articulate at last.

The old man stood erect in the opening, with a hand upon his thoughtful brow. "I don't know," he said. "I didn't think they could come. They must have mastered secrets of time and space that we know nothing of. They have conquered our limitations of distance. They must be ages ahead of us!"

"But the house—it just melted away!"

"As for that, the emanations of the green cloud must have disrupted the atoms, allowing the electrons to fall together to make neutrons (formed of united protons and electrons) so small that they fell through the ground, toward the center of the earth. That is easy enough to understand—in fact, I could probably have developed a similar ray myself, as a result of my work on the hydrodyne. The strange thing is how they got here!"

"The thing just seemed to appear and vanish!"

"Possibly we could see it only when it was lit with the radiation of the green. It may have just slipped up and away in the darkness. But it is more likely—judging from the etheric disturbance it created—that it did not come through our space at all, but moved by the distortion of hyper-space—came through the fourth dimension, in effect!"

"And they seemed to know just where to strike!"

"Yes. They must have found that by triangulation on my interference waves I was doing the same trick for them when the apparatus warned me."

"You were what?"

"I have been working a long time to get the direction of that mysterious force."

"And you succeeded!"

"You remember the Mangar Deep?"

"What? Oh, yes. Discovered in the South Pacific by Mangar and Kane about 1945."

"In 1946, I believe. The disturbance comes from there. *It emanates from a point ten miles below the level of the Pacific!*"

"What! Impossible!"

"Do I make mistakes?" Sam asked softly.

"No. But the discoverers reported only six miles of water. And anyhow, men couldn't live under there!"

"The exact spot is somewhat south of their soundings. But, Mel, don't assume that we have to deal with men! We may be dealing with entities that developed in the sea, even with creatures of the rocks below the sea! I tell you, it's outside the range of your old anthropomorphic fiction!"

I could say nothing more. I sat still, with rather unpleasant thoughts. Intelligences that could reach casually from a point ten miles below sea level, to wipe out a building ten thousand miles away! Such things are very good in amazing romances, but extremely hard to face squarely in real life!

For many minutes Sam was silent. He had pulled out his battered pipe and filled it absently with illegal tobacco. He stood puffing on it steadily, with the dim glow coming and going on his tanned face as he drew. Presently he spoke very softly:

"Mel, we can go in the Omnimobile to see about it."

"Dive into the Deep!"

"We could do it."

"Ten miles of water! Good Lord! That would crush us like—like—"

"I think the machine would stand it."

"But what could we do?"

"We don't know until we know what needs to be done."

"It means death!" I whispered hoarsely. "And the Green Girl! When I am dead I may dream of her no more! It may be that she lives only in my mind, and when I die—"

Sam said nothing. He merely waited, puffing away, with his pipe smoke drifting out into the night. In a moment I had considered, and realized my selfishness. I thrust out my hand, and he gripped it firmly.

"I knew you would see it, Mel!" he cried with a glad ring in his voice. "Whoever, and whatever they are, they haven't got us yet! We're still kicking!"

"We start for the Mangar Deep—"

"—At sunrise in the morning."

We climbed down into the machine, and went to-

gether into the galley to fix supper. Sam got out his old music box and played through his ancient favorite selections, and then we went to our miniature staterooms.

But I did not sleep soon that night. The Green Girl came to me in a fresh and vivid waking dream. She was, as ever, supremely, superbly beautiful, with dark curls, smiling red lips, and clear, sparkling violet eyes. I told her of the struggle I had had, and that I was resolved to set out upon the fateful cruise. And she seemed very happy, so I regretted my decision no longer. So, very happy, I fell asleep, and had dreams of the Green Girl that were dreams indeed.

At dawn I was awakened by the rattle of pots and pans in the galley. I sprang out of my bunk, took an icy shower, and ran into the dining room where Sam had breakfast ready. The stores had been well selected, and Sam was a prince among chefs. Whatever our fate, we would approach it feasting like kings.

He seemed as cheerful and confident as myself. Now that the issue was determined, the uncertainty of action was removed, and we both felt oddly relieved. After we had eaten, we started the engines and drove the machine back to the hilltop where the cottage had been. We got out and examined the surface of the ground that had been acted upon by the strange red dissolution.

The earth had evidently been eaten away to a depth of several feet, and the surface was left covered with a hard, greenish vitrified crust, smooth and hard as glass. It was unpleasant to think what would have happened if Sam had failed to intercept the warning of the approach of that amazing machine—if it had been a machine.

CHAPTER IX

Into the Mangar Deep

WE hurried back into the Omnimobile, climbed into the conning-tower, and started the engines again. Sam turned the bow toward the sea, and the great machine crawled slowly down to meet the lapping white waves. In a few moments they were slapping and splashing against her sides.

On we drove, down the sloping sand. The green water rose about the windows. In a moment the periscope screen showed that we were entirely under water. We crawled steadily over the bottom of the sea, deeper and deeper. All the wonders of the hidden sea-life lay about us, bright corals and strange shrubs, curious rocks, and beautiful dells between them, through which silvery fishes and stranger monsters of the deep were moving. It grew darker, and Sam turned on the powerful searchlights. We moved on down into stranger regions. But I must not take space for that, for we were hastening toward a world that was weirder by far!

In half an hour we closed the valves, which had been left open to let the water flood the tanks, and started the pumps. We were lifted above the ocean floor. We stopped the caterpillar tread, and set the screws into motion. In a few minutes the Omnimobile rose above the surface and splashed back into the blue waves like a gigantic dolphin of silver metal!

I climbed out on the deck. The Florida coast was a bright green line in the west. The serene blue vault of the heavens was illimitable above us, and the deeper blue expanse of waters lay about in a flat, measureless plain. The machine throbbed almost imperceptibly with the motors, and the prow sent out two white wings of water. The plates were wet and slippery with the spray. I thrilled to feel again the motion of a powerful craft beneath me, to smell the salty tang of the air, and to feel the tingle of the salt mist upon my skin. We were making a good fifty knots, and I had to brace myself against the cool, damp wind of our progress. Thanks to her gyro-stabilizers, the vessel was perfectly steady.

I stood there a long time, gripping the low rail, and lost in the wonders of sea and sky. I felt very much a part of all that splendid, sunlit world. I felt a deep, poignant regret at leaving it. But I found myself feeling—with a little surprise—that I could be willing enough to give up my life to save it!

At last I went back into the conning-tower. Sam stood alert at the controls, with an odd, exultant light in his eyes, and with a smile of joy and confidence on his lean face. With his hands on the levers, he turned to me and said:

"The little old machine's a wonder, Mel! She runs on sea, land, or air! It's a great feeling to drive her! She'd go anywhere! You know, I wish we had time to make a trial for the moon!"

"There's no hurry about that!" I assured him heartily. "The moon will keep!"

Presently I took the controls. Sam fixed dinner, and brought my meal in on a tray. Then he went to his stateroom. I enjoyed my spell at the controls. Indeed, as Sam had said, the handling of the machine gave one a strange sensation of power, of omnipotence, almost. It was the same feeling of unconquerable, careless power that a god might have enjoyed. I was almost sorry when Sam came to relieve me in the evening, and I had to go to my bunk.

When I got up to take his place again, it was night. The generators were beating steadily, and the Omnimobile was ploughing her way through heavy seas. The sky was black, and occasional brilliant flashes of lightning lit the sheets of falling rain that drummed on the metal deck. When he showed me our position, it was in the Pacific, off Central America. I knew that he had used the rocket tubes to carry us over the Isthmus.

For two more days we kept the bow southwest, in the direction of the Mangar Deep. Sam and I alternated at the controls, and he took time to prepare our meals when he was off duty. The cabin was fixed up most comfortably with bookcases, table, and upholstered divan. During the second long afternoon I looked over my old stories of science, and read again Verne's immortal story, *Twenty Thousand Leagues Under the Sea*. I was somewhat amused at the thought that I was aboard a stranger and more wonderful machine than that of the fantastic tale, and that our adventures had already been far more amazing than those of the great romance at which so many practical people had scoffed. If I had known what was to come—well, I suppose I could not have composed myself enough to read at all!

At evening on the third day, the sea lay cold and blue about us, and the northern sun was crawling along the horizon to sink cold and bright in the clear northwestern sky, turning the westward waves into a glittering sea of frozen fire, and gleaming with prismatic whiteness on the snow caps of a few vast icebergs that dotted that far southern sea: Sam stopped the engines. We

floated in that wintry, lonely ocean, infinitely removed from the busy world of man, over the Mangar Deep—over the lair of the hidden menace!

I stood on the gleaming wet metal deck, shivering slightly from the chill of the keen south wind, breathing deep of the fresh salty air, and lost in the never-aging wonders of the sea and sky. I felt even a distant kinship with the blue, white-capped mountains of ice that lifted their massive frozen spires to meet the cold sunshine. How often, in the incredible adventure to come, was I to fear that I was never again to see the blue of the sky, or to feel the ancient spell of a limitless surging sea!

I took a last deep breath, and went below. I was a little surprised to see that Sam was closing the ventilators, opening the oxygen apparatus and air purifiers, inspecting the pumps and valves, getting ready to dive.

"Surely we can't start till morning?"

"Why not? At two hundred fathoms night is the same as day."

"I hadn't thought of that. Then—".

"Before we see the sky again, we shall know—"

With a queer tightening in my throat, I saw the manhole closed for the last time upon the fresh, cold air of the sea. In ten minutes more we had let the water into the bouyancy tanks. Green water and gleaming monsters of the sea rushed upward in the steady glare of the searchlights beyond the windows.

I stood at the valve and pump controls, while Sam busied himself in seeing to the torpedo tube and the machine gun, and in adjusting his electric arc weapon. Then he brought out a grotesque suit of steel submarine armor he had had made, with oxygen tanks and electric searchlight, etc., attached.

Swiftly we were dropping into the Mangar Deep!

CHAPTER X

The Depths of Fear

In the deep sea the temperature is just above freezing; the darkness is absolute; the pressure is many tons to the square inch. But still, life has been found, even in the greatest depths. It is strange life, to be sure, for the organisms must be developed to withstand the great pressure, and to generate their own light. It is an odd truth of nature that there is some form of life adapted for each locality. There are the mosses and reindeer of the frigid north, the cactus and lizards of the burning deserts, the blind creatures of the Mammoth Cave, the stranger things of the deepest seas! May it not be that there are entities living out in space, or in the earth's interior, of which we may never know? Such were my thoughts as we dropped to meet the menace that had risen from under the sea!

We sank swiftly, and steadily the manometer climbed. The water was dark but for the bright beams of the searchlights, and very cold, though, with the insulation and the electric heaters, we felt no discomfort. The pressure on the plates must have been terrific beyond conception. It seemed impossible that metal—even our cleverly braced plates of the wonderful beryllium bronze—could withstand so much, when even the rocks of the ocean floor "creep" and bend beneath the water's weight!

Thousands upon thousands of feet we sank, and still the sea was dark and cold! In our wild plunge downward I caught fleeting glimpses of many of the weirdly grotesque creatures of the deep, flashing past in the gleam of our lights.

At last Sam had completed his preparations for the emergency that might arise when we reached our goal. He came into the conning-tower. I looked at the manometer—in fact, I had been looking at it most of the time.

"Pressure four thousand pounds!" I read. "That means we are nearly eight thousand feet down! I wonder how much longer—"

"Remember," Sam said softly. "Remember that we have to go ten miles down—fifty thousand feet!"

"Fifty thousand feet! Every cubic foot of water weighs sixty-five pounds. Fifty thousand times sixty-five, divided over one hundred and forty-four square inches. That is—about twenty-two thousand pounds to the square inch! Eleven tons!"

"Somewhat more, I fancy, say 23,800 pounds," Sam observed calmly.

"What's the difference? Nothing could live or move under such a weight!"

"The thing we have come to investigate lives there, if it is a living thing at all."

I said nothing more. Somehow, I did not feel inclined to conversation. I could think only of the terrific weight of water so near, pressing so mercilessly upon the thin plates, think only of how cruelly it would crush and tear us when it found its way in! I gazed at the little needle with a sort of fascination. It crept slowly around the dial, counting up the pounds of the irresistible pressure that surrounded us.

The minutes dragged by. The little needle showed a depth of fifteen thousand feet, almost three miles. The height of a good mountain, and still it crept up! And yet we were not a third of the way! Suddenly I heard a splintering crackle that grated roughly on my strained nerves. I looked down. The unconscious grip of my hand had splintered the top panel of the back of a chair by my side!

Sam was looking at me, grinning. "I'm glad you didn't have your hand on me, Mel."

I glanced back at the needle, and shouted in surprised relief.

"It has stopped!"

Truly, the pointer stood still! As we watched it, it hung still a moment under my riveted gaze, and then crept back!

"It's a turning point! The pressure is getting less!"

"It couldn't be!" Sam said. "Unless we are rising!"

"No! See! The bouyancy tanks are still flooded!"

"The duplicate pressure gauge?"

"It turned back with the other!"

"Look! Yes, we are still sinking." He pointed to the windows. "See! The fish are still flashing upward in the light!"

In speechless wonder, we stood and watched. Still we were evidently sinking. Still the dark waters rushed up about us. And still the needles crept back!

Suddenly Sam seized my shoulder in a hand of iron. "Look!" he whispered hoarsely, pointing out through the heavy lenses. "Can't you see? A light! A red gleam beyond our searchlights!"

A switch clicked under the nervous fingers of his other hand, and our lights went out. In a moment, as soon as my eyes were accustomed to the darkness, I

saw that he was right! The sea was not black! There was a pale, roseate glow suffused through it!

Steadily it grew stronger. We were coming into a region of light, and of decreased pressure, at the bottom of the sea! Of all wonders!

The red light grew stronger, until it seemed that we sank through a sea of molten ruby—through an ocean of blood. Intense red light poured in through the lenses until I had to hide my eyes. With shaded eyes, Sam bent over the manometer.

"Only two hundred feet!" he cried. "Fifty! Ten!"

Suddenly the floor fell away from beneath my feet. We seemed to have dropped from the sea into a lake of fire. A blindingly intense red glare poured in the windows. I was very sick. The ship reeled about me, the floor sank, dropped away! I grasped dizzily for the table, drew myself blindly toward it!

I remember hanging limply and helplessly to the table for a moment, remember Sam pushing me suddenly away. I have a dim memory of a crashing thunder of sound that reverberated deafeningly and seemed to roll away to infinite distances through the fiery mist. And with that strange, deep sound, my consciousness faded away!

CHAPTER XI

The Roof of Waters

THE next thing I knew I was lying on the floor, with a torrent of icy water falling on my face. I sat up, sputtering. Sam was bending over me with a relieved grin on his face.

"Care for any more?" he asked, emptying the pail.

"That's quite enough, thanks," I sputtered. "Where are we?"

"Right here."

"Talk sense," I pleaded, trying to get up, and rubbing the bump in my head.

"Really, I hardly know," he said, soberly. "It's rather queer. We're afloat on a smooth, warm sea! The sky is red!"

I stared at him stupidly.

"It's a good thing we had the rockets! If we hadn't used them, we'd have hit this water like a concrete pavement!"

"Queer, you say! My eye! We're both crazy! It can't be!"

"You might get up and see for yourself."

"You say we've fallen through the Pacific and into another sea?"

"I only know what I can see."

"We did seem to come out of the water into a red mist."

"So it seemed."

"But the Pacific Ocean overhead! We must have come through six miles of water! And water won't float on air!"

"We have several interesting questions before us."

I got uncertainly to my feet, walked past the calm old scientist, and climbed out on the narrow deck. Indeed it was a weird and incredible sight that met my eyes. Overhead arched a great dome of crimson fire. In all directions it reached down to the dark, warm sea on which we were floating. Nothing in sight but red sky and dark waves! There was a light, hot breeze, but the strange sea was very still. Its color was a blue-black, splashed weirdly with the reflected light of the crimson sky. It stretched out on every hand to where the red sky rose, utterly lifeless—lonely and dead.

We had fallen into an unsuspected and incredible world! Miles of water lay between us and our fellow men. Suddenly I felt an absurdly great loneliness, a vast homesickness for the world we had left—even if my fellow men had never meant very much to me! I felt an ineffably intense desire for the sunshine, for blue skies and green plains, and for the busy, cheerful cities of men! In fact, I almost burst into tears.

It was not so much that I was afraid. But the place seemed so strange, that even after I was dead my soul could not find a way out!

If there had been a rock, or an island to break the monotony of the ghostly, silent sea, it would not have been so bad. But there were none. The strange dark desert of waters stretched out as far as my eye could reach! The eerie, scarlet radiation of the sky beat down with intense heat, and the wind was damp and sultry.

Abruptly Sam stepped out beside me. There was almost a grin on his lean, tanned face, and he looked somehow very confident and resourceful. I felt a great wave of faith in him and in the wonderful machine beneath our feet, rocking silently in the strange, smooth sea. Impulsively I reached out my hand to him, and he took it with a smile.

"I know how you feel, Mel. But we're still kicking!"

"But the ocean?" I asked again. "What could hold it up?"

"I've been doing some pretty stiff thinking along that line. I have a theory that might help you, even if I have missed the point. You know we came through the red gas that makes the curious sky we see. The gas was just below the water. It's evidently radioactive, or it wouldn't be luminous. Its emanations might change the gravity of the water above!"

"Negative gravity or levitation?"

"Something of the kind. You know that science has held for a long time that there is no reason, *per se*, to doubt the existence of substances that would repel instead of attracting one another. In fact, the mutual repulsion of the like poles of a magnet is, in a way, an illustration of that very thing. Even assuming the existence of substances of negative gravity, they would not be found on the surface of the earth, for they would escape into space as fast as liberated. The phlogiston of the old alchemists, by the way, was supposed to be such a substance.

"But suppose the gravity of the water is negatived by the gas. Water, you know, has the property of becoming radioactive after it has been exposed to radium emanations, and it is logical enough for it to assume the qualities of the gas. The water next to the gas may support that above."

"But it looks as if the gas would bubble out, like air under water," I said.

"That was the principal objection to the theory. But we know from our pressure readings that the water is not resting heavily on the gas. If it is supported by the negative gravity of its lower stratum, the equilibrium is very delicate, but it would be naturally maintained.

"Suppose the roof of water is lifted. The gas and atmosphere below, being given more room, would expand. Consequently the gas would be brought less intimately into contact with the water, the negativing

effect would be reduced, and the balance would be restored. Conversely, a sinking would compress the gas, increase its effect, and bring back the balance. Even if the water sank in one place and was lifted in another, the difference in the density of the gas at various altitudes would maintain the equilibrium."

"Yes. Yes, I believe I see. A thousand thanks! It makes me feel a lot better to see how it could be," I said, admiring the wonderful readiness with which he had formulated his theory. "But can you say how the gas came to be here, and how there happens to be breathable air beneath it?"

"Both might have been manufactured by the intelligences we have come to investigate. More likely, however, the gas comes from the disintegration of the radium in the earth, and has been rising out of fissures in the ocean floor and collecting here for ages. The oxygen of the air may have come from the decomposition of rocks —the earth's crust is nearly fifty per cent oxygen. This place may be as old as the sea. That alien power may have been growing up in here through all the ages that man has been developing outside!"

"You think there may be living things here?"

"No reason why not. In fact, this is the logical habitat for your Green Girl. Red and green are complementary colors. If there are people here, green would be the natural color for the protective pigmentation against this red light!"

CHAPTER XII

The Second Sea

LEAVING me to the visions and the flights of wild hope that his last words induced, Sam went below. In a few minutes he called me to eat. Suddenly I realized that I was very hungry. I looked at my watch. It was eight o'clock.

"Why, is it just two hours since we left the surface?"

"No. It's fourteen!"

Forgetting the intense red sky, the strange, smooth sea, and the damp, hot wind, I went below to meet Sam's wonderful biscuit, with fresh steak and fruit from the refrigerator. A very mild and colorless beginning for adventurers newly fallen into an unknown world, but a very sensible one!

After the meal, each of us took a turn on guard in the conning-tower, while the other slept. Nothing happened. The soft hot wind blew steadily out of the south, the bloody glare of the weird sky was changeless, and the sea lay about in a motionless desert.

The thermometer outside registered 115°, but on account of the automatic temperature control, the machine was comfortable enough, though the heat and humidity on deck were stifling.

When we had rested, we turned the bow of the Omnimobile toward the north and cruised along at a speed of four of five knots. I stood in the conning-tower at the wheel, while Sam busied himself with making an analysis of the air, and of a sample of water from the sea. Presently he came up out of the little laboratory, with his report.

"The air shows to be 31% oxygen," he said, "and 64% helium, with the remainder a mixture of various other gases. The barometer pressure is only eleven pounds, which compensates for the excess of oxygen. The helium is a good indication of the radioactivity which must have produced the gas overhead, since helium is one of the ultimate products of radium disintegration. The oxygen must have come largely from the breaking up of carbon dioxide by plant life."

"Then there is life?"

"There were microscopic organisms, both animal and vegetable, in the sample of water I took. The water, by the way, carries only 1.23% solid matter, mostly sodium chloride. Less than half as much as the sea above, which has 2.7%."

For several hours longer we moved slowly over the surface of that warm, silent sea. In all directions it lay flat as far as my eye could reach, its blue-black depths glancing with the unearthly crimson of the sky. Sam was still working in the laboratory and looking after the machinery.

And then I saw the first living thing!

My roving eye caught a tiny black speck against the gleam of the bloody sky. It was soaring, drifting slowly, like a vast bird—its motion was too irregular, I thought, to be that of a flying machine. I flung the little port open, and tried to get my binoculars upon it. It was very far away, but I made out that it was a vast, strange, winged thing. It seemed very large to be a bird. And its colors were bright—fantastic! It seemed—I was sure—that its wings were green! But it seemed to be moving faster than I had thought. I never got it clearly into focus, and suddenly it dived, and was lost beneath the horizon!

"Sam! Sam!" I called sharply. "I've seen something—something *alive!*

In a moment he was climbing up into the conning-tower, with a question on his lips. I described my confused impression of the thing as best I could, mentioning the strange colors.

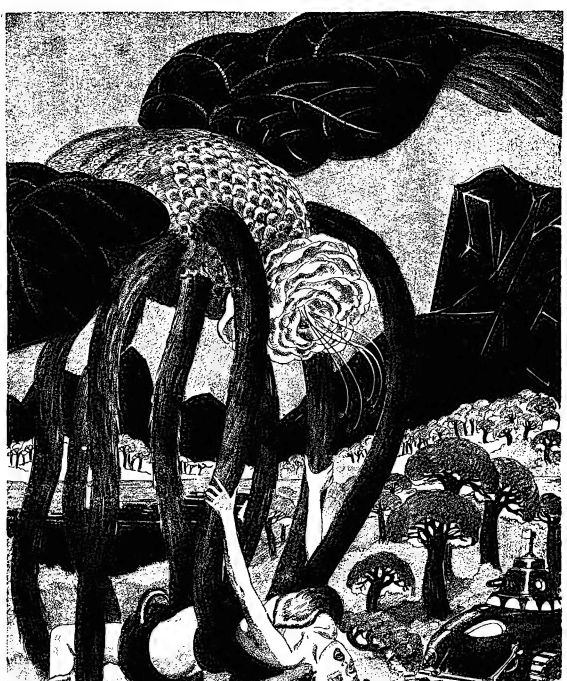
"More than likely, Mel," he said, "you wouldn't have recognized it, even if you had seen it clearly. You could hardly expect to find life here like that we know. The chances are that evolution has taken a widely different course in here. Even the tiny things in the sea were strange to me. And in a world like this, of hot and endless day, we're likely to find jungles with great insects and huge reptiles—a fauna and flora corresponding to that of the Carboniferous Era on the surface."

"Then you think there is land here, trees, even men! You really think—the Green Girl?"

"That was just an idea, about the green tan. But there is sure to be land, of some sort, where the lips of this abyss curve up to meet the water above. And there is no reason why there might not be life upon it—highly developed life, at that. Life may be as old in this place as outside, perhaps older, for it has been protected from the cataclysms of one kind and another that may have swept life off the surface again and again through the ages. And we know there is some kind of intelligence here—"

"No wonder they were willing to freeze the earth! They couldn't tell the difference if the sea were frozen a mile thick!"

Still we held our course to the northward. Presently Sam went back below again. An hour later the horizon was broken by a line of dull blue in the north. A thin blue strip appeared between black sea and scarlet sky, and widened slowly. In another hour I could make out a wall of towering blue cliffs all across the north, rising



For a moment my eyes searched that strange scene in vain, and then I saw the huge green wings of one of the terrible flying plants, flapping deliberately above the brilliantly purple trees a hundred yards to our right. . . . Without waiting to see the cause of his frantic appeal, I swung the gun, trained it, and depressed the firing pin. "Mel," cried Sam, "one of those red tentacles was wrapped around a human being"

from the sea as if to support the red sky. They were veiled in the mists of infinite distances. When Sam had made his observations, computed his angles and completed his calculations, he announced that they were a hundred miles north of us, and met the red sky at a level four miles above us as we floated along!

That meant that we were nine miles below the level of the Pacific, according to Sam's figures. The seat of the menace we thought to conquer was a mile below us yet!

As the hours went by, and we still went northward at our crawling pace (we went slowly because Sam thought that the use of the engines at full power would create an etheric disturbance that would reveal our position to our mysterious enemy). The jagged rim of the abyss rose steadily out of the sea. The cliffs, when I focused my powerful glasses upon them, seemed composed of sheer columns of blue rock, reaching up to meet the red roof of waters like gigantic prisms of blue basalt.

At last my searching eyes glimpsed a patch of green below the blue. A vast slope of green hills drew up out of the red-black sea. They gleamed with the pure verdant emerald of well-watered grasslands. Here and there they were marked with huge, strange splotches of purple. I was ever amazed anew at the vastness of the weird world about us.

Steadily the green and purple slopes lifted themselves out of the dark sea before us, and stretched up, through vast plains and low hills, to the sheer wall of rough blue cliffs that lay all about the north, cut off so sharply at the *top by the red sky.*

At last we came in view of the shore—fringed with a jungle of green and lofty forest. Huge those strange plants were, with long thick leaves, grotesque forms, and fantastic flaming blossoms! I stared at them through the binoculars. They were like nothing that is or has ever been above the sea—like nothing that I had ever seen or imagined! They were strange wild trees of another earth! Their green was weirdly tinted with purple, or with queer metallic tints of silver and bronze! Their incredibly great blooms were prolifically borne and infinitely varied, making the weird jungle an alien fairyland of bright and multicolored flame!

A fit habitat, indeed, for the monstrous things we found there!

CHAPTER XIII

The Flying Flowers

IT was several miles back of the shore to where the green grassland rose from the jungle to slope up to the cliffs of gleaming blue. I had ceaselessly searched the plains and the jungles for a sign of life or intelligence; but, so far, I had seen nothing save the weird flying monster of which I had caught a glimpse.

But suddenly a huge winged thing arose from the jungle strip! In a moment two more had joined it from the shore! In a few minutes a score of vast weird monsters were circling over the beach ahead! They were strange things, incredible, almost. I might have doubted my eyes but for Sam's warning of the strange things we might encounter. Their colors were bright. The wings were plainly green and of a spread of many yards! They flew with slow and regular wing-beats.

It was some time before I got one focused clearly in the glasses and then I gasped in astonishment and terror at the weird creature that seemed to spring at me from the lenses. It was neither bird nor winged reptile! It was not an animal at all!

It was a winged plant!

The great flapping wings were broad and green, braced with white veins like the leaf of a plant. The long body was plated with coarse brown scales, and tapered to a green-fringed tail. Eight long blood-red tentacles dangled in pairs below the body. They were thick, and the coils of each must have measured many yards in length. Each bore at the end a single terrible claw. *And instead of a head, the thing carried on the forward end—a flower!* It was huge, of many petals, brightly colored! Out of the calyx were thrust three dead-black, knobbed appendages that must have been organs of sense!

It was a vast thing—unbelievable! It was as large as an airplane! It was terrible—a nightmare monster! I could scarcely believe my sight, though, after what Sam had said, I might have expected such a thing.

I do not remember calling Sam. I was too much amazed. But suddenly he climbed up beside me, and took the binoculars from my unconscious hand. With a fearful gaze, I watched him raise and focus the instrument, trying to read in his lean, tanned face the meaning of the astounding things.

I saw keen interest reflected there, surprise, intense concentration, but nothing of the strange terror I felt. A sensation of immense relief came over me, and I made a half-hearted effort to smile as he lowered the glasses and looked at me, grinning.

"Don't let it get you, Mel," he said. "I was expecting something of the sort—or more so. They are no more terrible than the old winged saurians, probably. At any rate, the Omnimobile can take care of herself. We're likely to meet something worse before we're through."

"I hope not!" I said, piously. "But the things are plants!"

"Possibly. But the idea of animated plants is nothing new to science. The line of division between the plant and animal kingdoms is rather vague, and it seems that both developed from a common ancestor. Even today there are living things that can be classified neither as plant nor animal. Take, for instance, *Euglena Viridis*, the microscopic organism that colors green scum on fresh-water ponds. It is a plant, because it contains chlorophyl, and utilizes sunlight in the manufacture of food from carbon dioxide and it absorbs salts dissolved in the water. It is an animal because it can swim about very actively, and because it can absorb particles of food that it finds in the water. Carry the evolution of such a thing to the nth degree, and you have the flying things before us!"

Again, I had to admit that Sam had advanced a most plausible explanation for an amazing thing, but still I prefer my plants fastened to the ground.

It soon became evident that the monsters had discovered us. They approached and circled close above, green wings slowly beating the air, and the great blooms that were like heads seeming to flicker with varied colors. The thick, red tentacles coiled below the great brown shark-like bodies, with terrible talons drawn back threateningly.

"The things may be feeling unpleasant," Sam suggested. "It might be a good thing to fix 'em a hot welcome."

That had already occurred to me. I let Sam have the controls, and ran out and loaded the little cannon. Through the thick windows of the little conning-tower I watched the monsters flying above us. They followed as we kept up our deliberate advance toward the jungle-covered shore.

Suddenly one of them dived down upon us. The impact of its heavy, shark-like body shook the machine, and its great claws grated over the metal plates with an unpleasantly suggestive sound, as it strove vainly to rip them open. I felt some alarm. For sheer fighting power I would match one of those flying plants against any animal that ever walked on earth. In wing-spread it was fully as long as the Omnimobile, though the machine was, of course, many times heavier.

I slipped into gear the machinery that revolved the turret, and as soon as a portion of that rough, armored brown body was fairly before the gun, I let fire with an explosive shell. The whole machine rocked with the force of the explosion, and the side of that vast scaly brown body was torn off. A viscid green fluid gushed out, dying the deck and tinting the water alongside. The terrible grasp of the thing relaxed, and it slipped off into the sea.

The others were hovering low, but in a moment Sam had submerged the machine, and we made for the shore

under water. In five minutes we struck a soft, muddy bank. He shifted the caterpillar tread into gear. The machine waddled up the muddy slope through the fringe of strange plants, and broke into the weird jungle.

The unearthly radiance of the sky filtered through the jungle roof in a dull crimson light. In the vague, ominous twilight, huge and monstrous tree-trunks rose all about us, as much like great fungoid growths as like normal trees. We pushed through thickets of weird purples and strange metallic hues, under vast masses of hanging green vines, all hung with gigantic incredible blooms that were so bright they seemed to light the dusky forest with their vivid flames of crimson and yellow and blue!

For perhaps three miles the Omnimobile smashed her deliberate way like a gigantic reptilian monster through that strip of weird rotting jungle. Then we emerged on higher ground of a different vegetation.

CHAPTER XIV

The Prey of the Plant

We stopped the machine on the first little eminence of the open space, to survey the vastly different and unfamiliar region that lay before us. It was an open, park-like country. There were broad meadows and low hills covered with a fine turf of luxuriant green grass. There were scattering small groves and great solitary trees so profusely laden with vast purple blossoms that they seemed afire with purple flame.

It was a strange landscape, and not without a certain unearthly beauty. The rich, green plains and hills lay all about before us, scattered with clumps of brilliant purple woodland, and stretching up to the great blue cliffs in the misty distance. A lurid, melancholy weirdness was given to the scene by the awful scarlet glare of the sky.

Presently we rolled on again, across the broad level meadow, and over a little stream, and through a copse of flaming purple trees. We had gone another mile when Sam, still at the controls, shouted above the beating of the engine and the clatter of the machinery.

"Look, Mel! Get it! Shoot! North of us!"

Still behind the gun, I looked out quickly. To the north was an open green field of several acres extent. Beyond, the scattering purple trees rose, dotting the green hills until at last they merged in the slope that reached up to the cliffs in the misty distance beneath the amazing sky.

For a moment my eyes searched that strange scene in vain, and then I saw the huge green wings of one of the terrible flying plants, flapping deliberately above the brilliantly purple trees a hundred yards to our right. Sam was already swinging the machine about in that direction. Without waiting to see the cause of his frantic appeal, I trained the gun and depressed the firing pin.

The little gun roared sharply, slid quickly back and forward again in its recoil cylinders, and the mechanism clicked smoothly as another shell was thrown into the breech. For a moment my vision was obscured by the thick white cloud of smoke. Peering intently, I saw the unearthly monster flying more slowly—sinking. In a moment it was out of sight behind the purple trees.

"Did you hit it?" Sam cried anxiously.

"I think so. But why all the fuss about that one? There are plenty more back in the jungle."

"Oh, didn't you see? It was carrying something!"

"Carrying something?"

"Mel, one of those red tentacles was wrapped around a *man!*"

He had brought the lumbering machine about in the direction of the place where we had last seen the monster. We went at a reckless pace. The machine rocked and banged, and we were shaken up unmercifully when we crossed a dry watercourse. Two or three of the trees went down before our undeviating and irresistible advance, filling the air with purple clouds of petals from the great bright flowers.

Then I saw before us, thirty yards away, the great strange creature lying flat on the ground, with wings outspread. Beneath it, in the coils of one of the thick tentacles, I saw the gleam of a naked human body.

The machine jerked to a halt and I threw open the manhole and sprang out on the deck. In a moment Sam was beside me. He had buckled on an automatic pistol of the latest design and the heaviest caliber. He handed me a duplicate weapon, with ammunition belt and holster, with the warning, "We've got to expect the unexpected, and must be quick on the draw!"

I fastened on the gun, and led the way down the ladder to the ground. In a few seconds we stood by the dead monster. Seen at close range, it was an appalling thing, indeed. It was very strange, and even the dead body of it showed cruel strength. The green wings were like tough green leather stretched over a metal frame. The body was armored with thick, rough brown scales. The tough scarlet skin of the tentacular limbs was smooth and rubber-like. Already the weird flower at the forward end was withered and black. The ground about the thing was stained with a flood of green liquid from the terrible wound the shell had torn.

I hurried around it. Only the shoulder and arm of the human prey were in sight. Yes, it was a human being, and the skin had the clear smoothness of youth. I bent closer and perceived, with an odd admixture of feelings that made my heart beat wildly and then pause until I reeled, that the skin had a soft greenish tan. I saw that the body, lying under the wing alone, had not been crushed by the fall of the monster.

"We'll be able to tell what manner of mankind we have to deal with here," Sam said, though I scarcely heard him. "If our man was at all civilized, there ought to be ornaments, or remnants of clothing. I hardly expected human life here. But it may be a human science that is threatening our world!"

He stumbled over the end of one of the thick red tentacles. It moved uncertainly, and he stopped in a sort of fascinated horror. "God!" he muttered. Indeed, it was a terrible thing. The slick red limb, four inches thick, ended in a suction cup, with a hideous claw, a good twelve inches long, fastened at the side. It made one's flesh creep to think of that terrible claw ripping and tearing flesh, or of the cupped end of the tube sucking blood from it.

I pulled at the still white form beneath the wing. One of the crimson tentacles still clung closely about the young body. I tried to pull it free; but at my touch it seemed to tighten with a sort of aimless reflex action. Sam got out his sheath knife and cut at it. It was very tough, and the viscid green slime flowed from the abrasions in its rubber-like membrane, but presently we cut it in two. I drew the body from under the wing.

I echoed Sam's exclamation. "It's the body of a woman!"

CHAPTER XV

The Green Girl

IT was, indeed, the form of a woman—rather, of a girl. The eyelids were closed and still. There was no breathing, and no perceptible beating of the heart. But the body was very beautiful. The hair was soft and dark; the skin, white with just a hint of the green coloration. The features were regular, classic—perfect! The lips were still very red.

That form was familiar to me—it was the dearest shape of my dreams! It was the Green Girl! There could be no mistake. This was the flesh and blood reality of the delightful vision that had been the joy of my life. At last, my supreme wish was granted! I had found the Green Girl! But too late! She was so white and still!

As Sam remarked, his words reaching me faintly through a gray daze of despair, she seemed to have belonged to a rather highly developed race of people. In fact, so far as physical perfection goes, she was without parallel; and physical and mental endowments usually go hand in hand. The wide white forehead betokened a keen intellect.

Sam had expected to find ornaments on the body, but no such things as we did find! There was a thin band of metal about the waist! The twisted fragments of a strange metal object were upon the back, fastened to the white shoulders with metal clamps that gripped them cruelly!

It was evident that something, recently torn away, had been fastened to the back of the girl!

Sam brought a file from the machine. I helped aimlessly, mechanically, and we cut that metal frame off. As we worked over that white body, with its soft tints of green, I saw strange, livid marks upon the back, that stood out sharply from the warm hue of the skin! I had never seen anything like them. They were splotches of a dull violet color! They looked like burns, or stains, that must have been caused by the thing that had been fastened to her body.

"Radium burns?" I questioned Sam in apathetic curiosity.

"No. Something similar, perhaps. Radium emanations whiten the hair, but the color of the skin is not affected except by inflammation. This is the effect of atomic radiation of a shorter wave-length, I think. My hands were oddly stained for months while I was making my initial experiments with the artificial generation of the cosmic ray, which led to the hydrodyne. I found the cause and developed an effective treatment. I imagine that burn is the chief cause of her coma."

"Coma! Then she isn't——" My heart beat madly, and a mist came before my eyes.

"I think there is hope. She seems not to have been injured by the monster, or to have been seriously hurt by the fall. She is in a profoundly comatose state, due to the electronic burns, and also to physical exhaustion and the terrible hardships of which her appearance gives evidence."

"If you can save her——" I fell on my knees and raised that delicate head in my arms.

"Let's get her to the machine. It's cooler in there. We'll do what we can."

I picked up the silent body, still warm and limp, and carried it to the machine, up to the deck, and down into the cabin. I gently placed it on the divan, and nervously urged Sam to haste.

He deliberately began his work. He had included medical supplies in our equipment; and he was a doctor of considerable skill, whose special knowledge of the effects of etheric vibration was of greatest value here. I could do little except stand and watch him, or stride impatiently up and down the room.

First he quickly prepared a thick red liquid, with which he bathed the violet-colored burns. Then he made a hypodermic injection, and next administered a small quantity of some kind of gas—a mixture of nitrous oxide, or laughing gas, with something else that I did not recognize. In a few minutes the beating of the heart had become normal, and the breathing was resumed. He had me cover the patient up, and it soon became evident that she had passed into a deep but natural sleep.

I sat by the couch, feasting my sight on the reality of the vision that had been mine so long, in a fever of impatience for the time the beautiful sleeper might awake, so that I could speak to her, yet fearful of making a sound that would disturb her.

Sam had gone out to examine the dead monster more fully. In half an hour he came back in the cabin, carrying a queer writhing green thing in his hand. He held it up silently for me to see. With a sickening sensation, I perceived that it was a miniature replica of the great flying monster!

It was no bigger than a dove! The madly fluttering wings were a bright rich green, very delicate and soft. The thin, slender tentacles that clutched Sam's hand, or scratched harmlessly at it with undeveloped claws, were a pale rose color. The thin, fish-like body was almost white, and the little bloom at the end of it was now an intense violet in color, while the little black sense organs were thrust stiffly out of it.

"Quite a find!" Sam said. "We ought to learn no end of things from studying it, if we can keep it alive."

"Quiet!" I whispered. "Don't wake her! But where did you get it?"

"Tore it out of a curious pouch on the back of the old one. A cunning little creature, isn't it?"

"Not to my way of looking at it!"

"I wonder what it eats? Most likely it's carnivorous. The claws would suggest as much. And that assumption would demand that there must be large game of some kind to support the winged plants."

Sam carried the little monster on into the galley. In half an hour, since he had not come out, I left the sleeping girl and went in to see him, fearing that he had been bitten or stung by the thing. I found him with the grotesque little creature perched contentedly on his finger, sucking with the thin pink tentacles at a wisp of cotton he had soaked in condensed milk. An odd thing I noticed about it. The little bloom on the end of the body, which had been purple a short time before, was now white, flushed only with a pale pink glow.

"It's as friendly as a kitten." Sam said. "I'm going to name it Alexander. No reason why it should not develop into a young conqueror."

"Keep it, and give me a pet rattlesnake!"

And it was well he did keep it.

CHAPTER XVI

Xenora of Lothar

I WENT back to the beautiful sleeping girl, and sat down again in my rapt contemplation of the quiet charm of her face. She was breathing quite normally, and the face bore a slight smile of pleasure. Suddenly she moved, and the eyelids were raised. Clear violet eyes looked straight into mine—they were those eyes that have haunted me always.

"Melvin Dane!" she breathed in a voice that was low and musical and wholly delicious. She knew me! She spoke my name! Truly, it was the Green Girl! She was aware of the meeting of our minds upon the ether! "My chieftain of dreams!"

From beneath the light covers she reached a slender rounded arm, white, with just a hint of green tan. I took her hand in my own, feeling a strange thrill at the touch. After a moment of hesitation, when I struggled fiercely with that thrill, relaxing to it briefly, I put her hand quickly to my lips, and then released it.

I did not feel capable of speech. For all the hours since we had found the girl, I had been undergoing a storm of emotions—alternate joy and despair. Now, when the Green Girl actually smiled upon me, I forgot all my old dreams of how I would cross oceans and voyage through space to take her in my arms. I sat still, with a curious lump in my throat, in incredulous joy, not daring even to surrender to the delicious thrill of her touch.

She laughed softly, and questioned, "From whence did you come, chieftain of my dreams, or am I dreaming still?"

"It's no dream." I began awkwardly. "Though I can hardly feel that it isn't. I came from a land above the red sky. I have always dreamed of you! And now I find you real—living! What is your name? Do you have people?"

"I am Xenora. My father was the last prince of the old city of Lothar. My people now are few."

"You spoke my name! You already knew it?"

"Yes, Melvin Dane, I have dreamed of you since I was a child. Even now, before I awoke, I had a curious dream of you—I thought you were coming to me through the sky in a ship of fire." The poor girl had raised herself on her elbow. Now she lay back on the pillows again as if she were very weak.

"So you have known me always, too!"

"Since one day when I was a child. The old lost city was my playground, and even when I was very small I wandered alone through the great palaces of old Lothar, dreaming of the ancient time when her warriors were great. One day I found a strange machine in a ruined tower room. Curious sounds came out of it when I put it to my ears. And then came the vision of you—of the white prince of my dreams. Day after day I slipped back, to dream of you. But even when I could go back no longer, you still came to me in dreams."

"But now they are dreams no longer! You are mine!" I exulted.

I thought there was something wistful in her smile, a hint of sadness in her sparkling violet eyes. "Yes," she breathed, "even for a little time, it is real. A little time, before the end."

She rose a little, resting on her elbow. I took her hand again. How slender and small it was! She still smiled, a little wanly.

"Don't speak of the end!" I said, unconsciously lapsing into the strange tongue in which I had so often conversed with her. "I have found you. You are safe. The flying thing is dead!"

For a moment there was frank admiration in her violet eyes that went oddly to my head. "You killed it! You are like the great warriors of old!"

"Hardly," I demurred with painful honesty. "I did nothing except push down a little pin."

"But the Lunak, the flying thing, is not what I fear. It had taken me from a fate that was far worse. It was carrying me from the power of the Lord of Flame!"

Her eyes dilated as she pronounced the words, as if they were a curse of fatal horror. For a moment she seemed to struggle fiercely with some terrible fear. She sank back rigid and unconscious to the couch. I sprang to her and lifted her in my arms. I started to call Sam, but in a moment her body relaxed, and her breathing was resumed, though she did not open her eyes.

Still. I felt no haste to put her down. I brought her a little closer to my heart, and my lips were very close indeed to hers when suddenly her violet eyes opened wide. I almost dropped her in my speechless confusion, and I felt myself turning red. Embarrassed more than I care to say, I hurriedly departed for the galley.

I found Sam whistling cheerfully and busy making apple pies for dinner. I have known several men who called themselves scientists, but Sam is the only one of them who had mastered the science of cooking. He used to say that if he were going to be hanged, he would want to cook and eat his dinner first.

"What did you do with the little—reptile-plant?" I asked.

"Oh, Alexander's gone to bed," he said lightly, pointing to a ventilated cardboard box on the shelves. "But how are you coming on with your specimen?" he questioned with a grin.

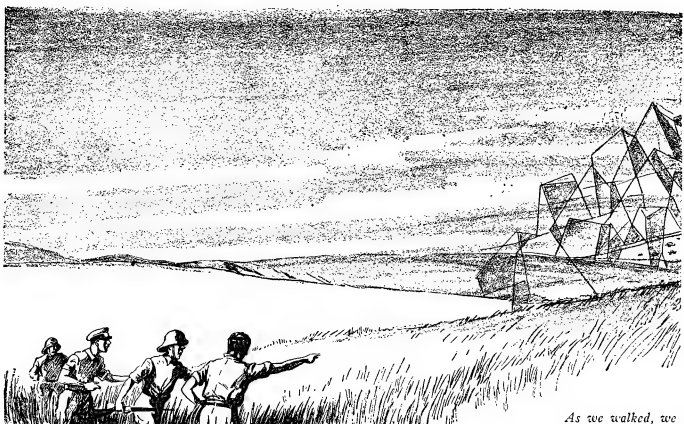
"Xenora seems—er—recovering very well. Perhaps you had better see her. She might think—that I——"

As Sam, with an understanding nod, walked toward the cabin door, I climbed out on deck, to think about it all. The great trees still whispered a little in the hot south wind, which was laden with the unfamiliar fragrance of the great purple flowers. The rich green grass moved in long waves before it. The red glare still beat down with a torrid intensity. I gazed up the vast slope of purple and green, to the blue cliffs in the distant north, and wondered about what the girl had told me—and about what she thought of me now. I cursed myself for my impulsive action.

A city of ruined palaces! A fallen race that had had a science great enough to build a radio machine—if such it was—which she had found and over which our minds had met! And a thing more terrible, and the flying plants! What had she meant by the words, "The Lord of Flame," the mere utterance of which had overwhelmed her with horror?

Then I thought again of the metal bands and frame we had cut from her body, and of the strange burns upon her skin. What was it that had caused them? Did all of that link up with the menace that threatened the earth? That might even now be doing its work?

END OF PART I



As we walked, we watched the city looming up before us. The closer we came to it, the more doubtfully we watched it. It was peculiar—the distorted caricature of a city.

Illustrated by MOREY

The Ship *that* Turned Aside

CHAPTER I

The Lights in the Sky

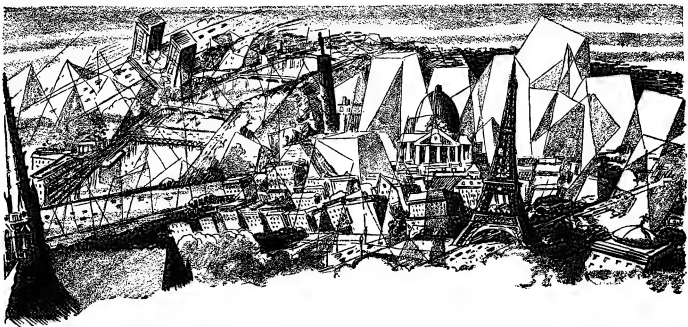
WE saw the lights our first evening out from New York. They grew in splendor until, for three of us, the voyage ended. For the others, they may still move sometimes in the sky. They have never been explained, not even by Pretloe, who found some reason for every other fantastic thing that happened.

Standing by the rail after dinner that first night, I watched them. The sea was a little rough, but most of our passengers were veterans. Nobody had retired except one old lady. We stood along the rail or walked about the deck, speaking to each other occasionally with that shyness peculiar to people who meet for the first time on board a ship—especially a small ship—the first day out. The man beside me was Pretloe, but I didn't know that then.

"Curious," he said. "They don't look like an ordinary display." I noted his soft, precise voice, and his traveler's accent—that slightly foreign but indistinguishable trick of speech which marks a linguist. I said:

"I've never seen the aurora borealis. I don't know why I haven't."

"I have," he said, "and it's different—not so definite as this." He pointed out to me the peculiarities of these lights. They lay in a narrow band across the sky, diagonal to our course but far down toward the east. They appeared very bright, and they had a sort of mo-



PERHAPS because so little definite information can be obtained on the subject of the fourth dimension, authors with good imagination and an interest in scientific theories, find in this subject a fertile field to work in.

Why, after all, might it not be only a thin and penetrable veil of vibration or radiation that separates the third dimension from the unknown and mysterious fourth?

G. Peyton Wertenbaker's reputation as a writer of scientific fiction is established. He gives us some surprising and unexpectedly good turns in this bizarre tale of travelers in unknown space and in the fourth dimension. Besides, this story is a true literary classic.

By G. Peyton Wertenbaker

Author "The Man from the Atom," "The Chamber of Life," etc.

tion which couldn't be determined so far away. It became more evident during the next day or so, as we approached them. At first it was only a slight twinkling, such as stars appear to have. The lights didn't move. They looked more like the lights of a city the first night, and I heard passengers speculating as they went by, talking of zeppelins and floating cities.

Later on I tired of the lights. I took a few turns around the deck, and then went to my cabin. My companion was still watching, with a thoughtful expression, when I left.

The sea was rougher the next day, and rose perceptibly as night came on. There was little wind, though, and the sky seemed to be serene. After supper, we went up and found the lights there again. They were closer tonight, and still directly in our path. None of us were worried, naturally, but we were curious. I watched them, alone, for some hours. I saw the man I had spoken to the night before, but he was immersed in his own thoughts.

The fourth night out we ran into the storm. The sea had been rising steadily, and tonight it was becoming actually dangerous. The ship pitched and rolled with difficulty through heavy seas that drenched the decks. We looked at the sky through occasional showers of spray. But the wind was still very moderate, and stars were visible at times through the dark, thin clouds that raced across the sky. It was as though the sea had been thrown into confusion by some curious and magnificent struggle going on far under its surface.

The lights were nearly overhead, and very bright. Tonight they were clear and distinct. They didn't touch the horizon. They seemed to appear out of nothingness down the sky in the south, and arched up to their most brilliant point over us, ahead. Then they went down again into nothingness to the north and east. It was oddly difficult to follow them at their ends, where they disappeared. It was as if they lost themselves in the distance, converging together; but whenever I tried to see where they ended, my eyes would return automatically to their center, overhead.

I met Pretloe again. I had not seen him during the day since we left port, except at meals. We were at different tables: he had his meals with the Captain. Tonight we were alone on deck. I had come up because I have a thoroughly disreputable preference for rough weather. Pretloe was watching the lights. I spoke to him, and he nodded. After awhile he said:

"Do you notice how immovable those bands are? They seem to be fixed in the sky. They don't change position with the stars."

"I hadn't thought of that," I said. "Astronomy's not my line." Again he nodded.

"You see my point, though. And they're too sharply defined—more like physical objects in the sky than like bands of light."

I had noticed that. They had a certain rotundity, a perceptible effect of depth. They looked like long rods of a strange metal, heated white hot, and foreshortened by some indeterminable optical illusion. I could count an even dozen such rods. They appeared to be hundreds of miles overhead, but the clouds avoided them, thinning and dying out as they passed beneath. For the first time I had a vague feeling that something unknown and important was impending.

"You see that rod-like effect?" Pretloe was saying. I nodded. "I've had the impression for half an hour that they're turning over and over, very slowly, as on axes. Doesn't it seem so to you?"

I watched awhile, intently.

"I think I know what you mean," I said.

"Of course it may be only an illusion," Pretloe added.

We discussed the lights and watched them for several hours, until I found myself suddenly shivering with cold, and wet through to my skin. I turned away regretfully.

"This won't do," I said. "I'll have pneumonia if I don't go to my cabin." Pretloe retired a little to the shelter of a boat.

"I think I'll wait awhile," he said. "These lights have fascinated me."

I nodded good night to him, and left. It was hard even to move along the deck, with the ship tossing so. We had been issued life belts, but I didn't bother to put mine on. I got to bed with difficulty, and finally fell into a troubled sleep.

Hours later I sat up, suddenly awake. The ship was creaking and trembling and rocking in a confused medley of noise and motion. My trunk had come loose, and was pitching about the cabin in the midst of falling clothes and toilet articles. A brilliant bluish light streamed in through the port hole, lighting the cabin weirdly. My skin seemed to tingle and jump as if it were charged with electricity.

I rose hastily, snatched up my life belt, and ran out on deck. Most of the passengers were already there, comparatively quiet. I think they must have been overawed by the colossal majesty of the spectacle. The ship plunged desperately in the midst of the wildest sea I had ever encountered. Spray swept across the sky high over us, and from time to time waves battered against the side thunderously, rushing across the decks. There was obviously no possibility of launching a boat. Yet the little ship seemed to be holding its own somehow. The whole ocean surged about us with a strange appearance of lightness which we shared, riding it as though all at once gravity had been partly suspended.

The lights blazed above us, directly overhead. A bluish brilliance filled the sky and hovered about the ship and on the surface of the water. The ship quivered with it, and our bodies, the water, every object on deck seemed to be charged with electricity. There was an exhilaration in it for even the most alarmed spectators.

But nothing happened. After about an hour, the sea grew visibly quieter. The lights overhead dimmed a little, and the electric tension gradually diminished. A few stolid spirits went back to bed, and most of the women retired with obvious reluctance. The officers moved about on deck, assuring us that the worst was over, promising to have us called if anything more happened. I stayed on deck to watch.

After awhile the sky grew paler, and the lights began to fade. I noticed that they had changed position and were now stretched, as well as I could see through the spray, from horizon to horizon, even and parallel, along our course—unless we had lost our course in the confusion. The sky was clouding over. The dawn, when it came, was gray and cold—sunless. I went back to my cabin at last for a few more hours of sleep.

CHAPTER II

An Uncharted Sea

THERE were few of us at breakfast that morning. There was an empty place at the Captain's table, and I took it. I wanted to hear his opinion of what had happened. He appeared haggard and sleepless, but shaven and neatly dressed as usual. After a brief greeting, he took his place and fell into a profound meditation which lasted until the meal was half finished. Then he shook his head slightly, and looked up. I suppose he felt that he must not neglect us.

"Mr. Pretloe," he said, addressing my fellow watcher of the past few nights, whose name I learned now for the first time, "what is your opinion of what happened this morning? You are a scientist."

"It's not my field precisely," Pretloe said thoughtfully. "I'm inclined to wonder whether any scientist could honestly have an opinion."

"What do you mean?"

"When we left New York, nothing was known of any such phenomenon in the sky, or I should have heard of it. It appeared our first night out, and it seems to have been connected definitely with the storm. Did you have any message from the shore?" The Captain frowned.

"None at all. We mentioned the lights in a report, but received no answer."

"And have had none this morning?"

"Unfortunately," said the Captain, "the radio is not working this morning." We stared at him, and he hastened to add, "Oh, it can't be anything serious—some minor electrical disturbance. As soon as we have it in order there's sure to be some explanation."

But Pretloe looked skeptical.

The radio remained silent. Although it was apparently unharmed, all the messages we tried to send seemed to fade out as they left the instrument; and nothing whatever could be heard in the receiver except a very faint noise like static from time to time. Eventually even that faded, and the sending apparatus ceased to work at all.

The day was dark, until late in the afternoon. I walked around the deck with Pretloe. The sea was subsiding rapidly, but there was no sign of the sun anywhere. A perpetual twilight obscured the sea, and there were lights in the saloon.

About noon, I happened to glance up and saw the Captain looking helplessly at his sextant. His eye caught mine, and he saw Pretloe. He beckoned for us to come up. As we approached, he came forward anxiously, and spoke to Pretloe.

"Mr. Pretloe," he said, "I don't want anything said to

the other passengers about this, but I need your help."

"What's the trouble, Captain Weeks?"

"I can't find our course. There's not even a trace of the sun anywhere."

"But isn't the compass working?" said Pretloe.

"The needle just turns idly. None of the compasses are in order. All our electrical apparatus has been disturbed. Haven't you noticed how dim the lights are? Something is happening to our current."

"Can't your people find the trouble?"

"There doesn't seem to be any trouble, except that nothing will work. My officers are worried to death. And I've no idea which way we're headed." He brought his fist down with nervous vexation against the rail. "It's uncanny," he muttered.

Pretloe said he'd take a look around.

"I doubt if I can help much," he added. "Your men probably know more about electrical apparatus than I do. You can get your bearings, of course, whenever the sky clears."

"If it ever *does* clear," said Captain Weeks, looking gloomily up toward the supposed place of the invisible sun.

Pretloe found nothing. I spent the afternoon reading. I dismissed the Captain's troubles as purely temporary. I wasn't in any hurry to get abroad. About sunset time, I looked up and saw Pretloe. The sky had practically cleared, and it was brighter than it had been at noon.

"Mr. Burton," Pretloe said. I rose, glad to have his company. But he was frowning anxiously, and went on. "Isn't it time for sunset by your watch?" I glanced at my wrist.

"The sun went down at six-thirty last night," I said. "I noticed particularly. It's six-fifteen now."

"And practically clear."

"Is anything the matter?"

"Nothing, except that there's not a sign of the sun anywhere."

"What?"

"The sun has completely disappeared." For a moment I was stunned. Then I grinned.

"But my dear fellow! That's ridiculous!" I said. Pretloe smiled wryly.

"You can look for yourself," he said.

I circled the ship with him. He was right. It was clear now; the sky was blue, with the faint tints of red that come at sunset. There was no sound anywhere but the throbbing of the engines: the special silence of twilight was approaching.

"But it's impossible, Mr. Pretloe," I protested. "I didn't mean to doubt you, but—why, I'm no astronomer, as I've told you, but even at that I know that anything happening to the sun would involve the earth too."

"You can see, though—it's gone," said Pretloe.

"Our clocks are wrong?"

"But it's daylight. We've had daylight for nearly an hour—full daylight, nearly clear. We haven't seen the sun. If it had gone down before the sky cleared, it would be dark now."

I thought dazedly. Dozens of fantastic ideas suggested themselves.

"Could we by any improbable means have gotten into the Arctic regions?"

"We'd still see the sun so long as there was daylight."

"Couldn't a mirage of some sort do it?"

"None that I have ever heard of. And notice—" he pointed to the deck, "even a mirage that would deceive the eye, if a mirage like this is conceivable, could hardly interfere with the physical laws of light. And there are no shadows."

I followed his pointing finger. I cast no shadow on the deck, nor did Pretloe, nor did any of the chairs. The softest artificial arrangement of lights could not so completely have eliminated even the suggestion of a shadow.

Pretloe had just left the Captain. They had found no explanation. The Captain was waiting eagerly for a look at the stars. He didn't come to supper, and neither Pretloe nor I mentioned the impossible phenomenon of the sun's disappearance. The other passengers, for some reason, had observed nothing.

After supper we went on deck. Both Pretloe and I glanced up at the sky as we emerged into the open. It was nearly dark. Already several stars were faintly visible overhead. The light disappeared rapidly, and the stars came out one by one. It was a clear night.

I looked at Pretloe, and laughed with relief and amusement.

"Well, there they are." I said. "We shall find our course after all." And, for the first time, I realized how completely helpless we should have been if the stars also had disappeared.

"Will you come up with me to see Captain Weeks? I want to be sure he's satisfied." Pretloe said.

We found Captain Weeks on the bridge. He was looking up at the stars, motionless.

"Well, Captain," Pretloe said, "I suppose you've sighted your course all right by now?"

The Captain turned his head toward us slowly, as if he hadn't heard.

"Eh?" he said tonelessly.

"Have you found the course again?"

"No." The Captain turned. He looked at us fixedly in the dark.

"What's that?" I said, not understanding. "Aren't the stars enough?" He shook his head.

"No," he said again. "Look at them."

We looked up at the stars obediently. They looked all right to me. But Pretloe, after a moment, exclaimed softly,

"My God!" I turned to him helplessly.

"What is it?" I said. "I don't understand."

"Do you realize," said Pretloe, "that there's not a known constellation in the sky?"

CHAPTER III

Pretloe's Theory

LATER that night the sinking lights had faded until they were nearly extinguished. Pretloe and I had been observed with Captain Weeks on the bridge. A group of passengers came up to us on deck to ask about the lights. Pretloe seemed a little at a loss what to say, but I explained:

"All the ship's electrical equipment has been disturbed by the storm this morning. I suppose the men will have it in shape again before long."

One middle-aged man, stout and red-faced, whom I had met earlier in the voyage and taken a drink or two with, said protestingly:

"But good Lord, Burton, how are we to get around without lights?"

"I'll speak to Captain Weeks about it," I said. And that is how I became, along with Pretloe, an official ambassador to the Captain and a member of his immediate group.

We saw him later. He had just sent officers in search of candles provided for just such an emergency. The three of us, Captain Weeks, Pretloe, and myself, gathered in the Captain's cabin for a discussion.

"Mr. Pretloe," the Captain said, "there's only one man on board who can make even a pretense of explaining what's happened today. You're the man." Pretloe shook his head.

"I'm afraid there's not even one man who can explain it, Captain," he said. "I've only one vague idea that could in any even faintly conceivable way account for these phenomena."

"What is it?"

"It's too impossible to mention. You'll laugh at me."

"My dear sir," the Captain said impatiently, "you haven't seen me laughing at the disappearance of the sun. Nor at the sudden discovery of some ten thousand new stars in the sky. If you've any idea at all about this, I want to hear it."

At that moment an officer arrived with candles for our cabin, which was nearly in darkness. Switching off the useless lights, Captain Weeks lit two of them and put them on the table. He gave orders that they were to be issued sparingly. There was no assurance that our lights would return before we reached port. Then he went to a cupboard and brought out a bottle, glasses, and some Seltzer water.

"Here's whisky if you want it, gentlemen," he said. And he went on, in a gloomy voice. "You see, don't you, how absolutely helpless I feel? I'm certain that we lost our course in the storm—you remember how those lights seemed to swing around? I've put the ship back on a course as nearly as possible what it should be if we have lost it in that manner. The lights lay approximately northeast and a little north. I'm sure we didn't turn completely about. So if we *did* turn, we must have ended on a northeast course. We should now be following a course that will take us a little south of England—to be on the safe side. If we didn't change, then we're headed for the Mediterranean and Africa.

"But I've no assurance," he added, "that we're headed toward Europe or Africa at all. All I can do is pick out certain of the new stars and hold a course by them, wherever it takes us to. Our stores can't last indefinitely. Unless we sight land more or less on time, I'll have to say something to the men and the passengers. I see grave trouble ahead of us."

Pretloe nodded.

"I've already reasoned most of that out as you put it," he said.

"And your theory?"

Pretloe paused a moment. Then he said. "You've heard of the fourth dimension?"

The Captain grew visibly paler. He nodded.

"It's theoretically possible that if some cataclysm had turned us aside into a fourth dimension we should no longer be able to see the sun or any known stars."

"But—" The Captain knit his brows, and thought for a moment. "I see," he said. "It sounds like madness. But the whole thing seems like madness." I was thinking too.

"But look here, Mr. Pretloe," I said, "isn't the weakness in your theory the same weakness you found in mine? How about the daylight?"

"Not necessarily," Pretloe said. "There are innumerable theories about the fourth dimension. But put it this way. Suppose the whole of our terrestrial phenomena took place in a thin section of the four dimensional universe. All our senses are fitted to perceive only in three directions. Then, if we got out of the section in which we belonged, we could no longer see the sun. But, so long as no actual obstruction existed between our portion and the rest of the universe, there would still be sunlight. The sun would be there still, but out of our line of vision."

"But how about shadows—if the sun were still there? You said——"

"I know. But the sun would cast a shadow also invisible to us. Look at it this way. Suppose, again, that we all lived on the earth's equator, and that everything on either side of the equator were invisible to us. Now, if an earthquake, say, tossed us a mile or so away from the equator, the sun would no longer be in our two dimensional line of vision (provided the sun strictly followed the equator) and it would cast just such an invisible shadow."

"That's clear enough," Captain Weeks said.

"Yes," I objected, "but wouldn't it be simple enough to turn around and go back again? Couldn't we just turn the ship toward the course we were following, and get back on it?"

Pretloe smiled.

"How would you go about it?" he asked. "In the one case, you would have no perception of a third dimension—all you could do would be to go on walking in a straight line for the rest of your life. In the other case—our case—the same principle applies. How are we to steer a course through the fourth dimension? We have neither senses nor instruments capable of pointing the way."

"If it was possible to get here, it must be possible to get back?"

"Theoretically, yes. But we'd have to learn how. It might take a cultured civilization having all facilities for research, hundreds of years to find that out. We have no such facilities."

"Consider this, too. If our equatorial man had landed facing northeast, he'd have had only to turn around, as you suggest, and retrace his steps to walk into the equator again. But he wouldn't know how to turn around or to deviate from a straight line. However, he could keep on walking until he encircled the globe. In that way he'd also get back. But he'd meet with a few difficult seas to cross.

"From the way those lights looked, I'm inclined to think they must have veered off at an angle somehow into the fourth dimension. In that case, no matter how we steer our course with regard to our own three dimensions, provided we have kept to our original direction in the fourth (and whether we do or not is beyond our control or knowledge), we have left our civilization some hundreds of miles behind us since the storm this morning. We don't know how to turn around, since that involves leaving temporarily our three dimensions.

"Theoretically, again, by continuing as we have started (providing always that the earth has a rotundity similar in the fourth dimension to its rotundity in the other three) we should in time come back to our starting point. This idea requires that we completely discard the

Einstein theory of the fourth dimension, although in effect it comes to much the same thing. But there are probably obstructions as obvious as those which would face our equatorial man—seas, mountains, possibly variations in temperature, and certainly a loss of all sunlight for a time, as in our Arctic regions."

I nodded, my head whirling a little.

"I see that all right," I said.

I got up and poured myself a drink.

"Won't you have one, Captain?" But Captain Weeks shook his head. "Pretloe?"

"I'll have one," Pretloe said.

I made the drinks and sat down again, swallowing mine gratefully.

Captain Weeks cleared his throat.

"Your theory sounds plausible, Mr. Pretloe," he said. "Does it account for everything?" Pretloe smiled—coldly and quite collectedly.

"I don't claim that it does," he said. "I see nothing that renders it invalid, although it may ignore some things."

"How about those bands of light?"

"I don't pretend to explain those, Captain Weeks. It seemed to me that they were too regular, too—well, too *nice* looking to be quite natural. But they might be some normally rare natural phenomenon we've never come up against before. Or they might be the work of a secret experimenter. That's a wild idea, of course. Again, though, they might even be the work of a scientist in some civilization unknown to us, outside of our portion of the universe. I have no explanation for them. I doubt whether we shall ever find one."

"They seemed quite thoroughly visible," I said. "How would they have looked if they had crossed our course in the fourth dimension?"

"Frankly, I don't know. You remember how they faded off at the ends? I feel sure that they went into the fourth dimension at those points, if there's anything to my hypothesis. Except for that, I can't say."

It was growing late. I glanced at the clock.

"See here," I said, "you didn't sleep last night, did you, Captain?"

"No, I'm afraid I didn't," he said.

"We'd better go, then. We're in your hands, you know. You are automatically our leader, no matter what happens or what dangers we have to go through. You'd better get some sleep. Pretloe and I can talk to you again about this tomorrow."

The Captain nodded with a faint smile.

"I suppose you're right," he said. "I feel pretty helpless at the moment, but there's nothing to do but go ahead as we're going now until something turns up." He rose, and shook hands with us. "You've been a great help to me, both of you. I want you to come up as often as possible and talk things over."

Pretloe nodded.

"We'll be a sort of cabinet if you like," he said.

We took our leave, and went down to our cabins.

"It's strange, isn't it," Pretloe said as he left me, "that the stars look quite as natural as they ever looked before?" I agreed ruefully.

"The one thing I've noticed about life," I said, "is that the most fantastic things that ever happen to a man seem fairly normal at the time. It takes a poet or a writer of reminiscences to appreciate romance."

CHAPTER IV

The Strange Coast

WE had almost no trouble with the passengers. The ship's officers, of course, noticed quickly the disappearance of the familiar stars. We explained Pretloe's theory to Mr. Grady, the first mate, and he took care of the others. One or two members of the crew seemed to know what had happened, but Mr. Grady silenced them in time, and the rest remained as much in ignorance as the passengers. Most seamen, nowadays, are like skilled mechanics on land. They know thoroughly their own work. They may have idle speculations about life, but they are incurious. They are so accustomed to the sky that they never really see it. Many of them can't name more than two or three constellations, and those they never look for.

Both sailors and passengers, when they realized the disappearance of the sun and the moon, went wild with speculation. At first they were uneasy. Some were superstitious, and prophesied terrible events—another flood, or the end of the world. But superstition, too, is nearly dead even among sailors. After the first few days everyone was accustomed to the strange phenomena. Nothing happened. The sea was blue and serene, day after day. Nothing disturbed the silence of the cool, dark nights.

We met no ships. For the first time in many years I was able to recapture the expanding loneliness of the sea that had overwhelmed me so during my first crossings. I knew now, as I had felt then, that we were lost in a world from which, for all I could tell, the land had sunk down and disappeared, leaving only an endless waste of ocean, rising and falling with the tides, moving in unending long waves before the wind. There was a sort of peace, as well as a sort of dread, in knowing that we might never again come to land—that we might sail on into the east until a final twilight closed about us with a sea still quiet, still murmuring absently to itself, as it went by alongside of our rails.

We were due in Liverpool ten days after we left New York Harbor. The tenth day arrived without any sight of land, but Captain Weeks gave out the explanation that, due to the storm we had weathered, we had been delayed possibly several days. A few passengers grumbled, but that was all. Monday afternoon—the eleventh day—Pretloe and I were closeted with the Captain in his cabin.

"You see, gentlemen," he was saying, "this is our dilemma. We have considerable stores of food, but they will not last indefinitely. And so long as we are concealing from the passengers what seems to be our real situation, we can't put them on rations—that would alarm them, and force our hand. And the candles are running low. If they have to spend their evenings on a dark ship, Lord knows what ideas will come into their heads. I've found from experience that men are still primitive enough to feel uneasy in the dark."

We agreed, and he went on.

"If we don't sight land—some sort of land—within a day or so, we're going to have trouble."

"True enough," said Pretloe. "And do you expect to sight land?"

"Well, what do you think?"

"I see no assurance that we shall. On the other hand, I see no assurance that we shouldn't—sooner or later.

If the ocean extends out into the fourth dimension on either side of what we called the world, it seems reasonable to suppose that the land does too. But we don't know our course, and we don't know at all how the land lies outside of our world. We may sight land today or tomorrow, we may sight it next week, or we may never sight it."

Captain Weeks nodded grimly.

"We have no data to go on. We know our own world, but not this one."

"Precisely," Pretloe said. "We can make certain assumptions. Others we can't make."

"Do you think there's any chance that this world is inhabited?" I asked.

"There's no way we can tell yet. There's no evidence of habitation."

"But your opinion?" said Captain Weeks. Pretloe shrugged.

"I doubt it. My opinion is that there must be something peculiar about our own stratum of the earth which renders it habitable. Otherwise, it appears to me that we should not be confined to such a thin three dimensional slice of what must be a vast, rich globe."

"What do you suppose that peculiarity could be?"

"It might be anything—perhaps something of which we are not even aware," Pretloe said. "We don't know what forces are operating on us in this waste land we have wandered into. Personally, I am inclined to suspect that the sun has something to do with it."

"The sun?" I exclaimed. "But how?"

"You know how necessary its light is to all plant and animal life. And you've seen plants turning their flowers and stems toward the sun as it moves across the sky during the day. It might be some instinctive attraction such as that.

"Our species originated most probably, you know, in the hot areas around the equator—under the sun. And it's still true that the hottest regions are the most densely populated. Then consider, too, how the ancient peoples all worshipped the sun, with rites and symbolisms that survive even now in our various church rituals, in our dream symbolisms, even in our subconscious daily motives and desires. Nobody has ever explained or understood fully the intense, varied, and mystic significances that the sun held for primitive peoples. Perhaps there was more to it than we realize—some definite and important kinship of animal life with the sun's path."

"And you think," I said, "that civilization has evolved in that narrow stratum because man needed the sun's occult influence?"

"Occult only in that we may not understand it entirely," Pretloe corrected me. "It seems probable enough that, because the sun is so necessary to us, our evolution has kept us in that one stratum and taken away from us any faculties which would have made us aware of these other reaches in the fourth dimension. Not needing any knowledge of them, we have, by the economy of nature, been left without the means of perceiving them. And it is possible that, if we should ever find a way of exploring into the fourth dimension, we shall evolve senses with which to understand it."

"How can you account, though," I said, "for the fact that our mechanical inventions—automobiles, ships, and so on—remain in our stratum with such docility? They have no instincts."

"For one thing," said Pretloe, "we keep them there. They work under our guidance. Again, too, if we could look at our world and our machines from an enlarged point of view that included a knowledge of the fourth dimension and its laws, we might find that there were other facts which made mechanics—at least our sort of mechanics—peculiar to our world. You remember that our lights have gone off, and the radio stopped working? That in itself is evidence that electricity must be nonexistent outside of our world—unless there are other kinds of electricity unknown to us.

"I imagine that magnetism and electricity—about which, you know, we understand comparatively little except that they are related to each other—may be related also to the sun and the sun's path. It is not difficult to believe that the sun, following for millions of years one path around the earth in the fourth dimension, may in some way have affected it—magnetized it, so to speak—and given it the properties which make radio and electrical phenomena possible. It might be some such process, too, which gave us our metals with which to create machines. There may be no metals beyond our stratum. And it may be some such magnetism which creates a band of attraction to keep our ships and tools from blundering out of the world. All this is pure speculation, of course. But we haven't anything to work with except our speculations."

"True enough," said the Captain. "I remember——"

I don't know what he was remembering or what he would have said. At that moment there was a hasty rap on the door, and Mr. Grady, the mate, burst in. Breaking off with his remark, Captain Weeks turned and said:

"What is it, Mr. Grady?"

"We've just sighted land, sir."

"What!" The Captain leaped up, and Pretloe and I followed. "Are you sure?"

"Yes, sir."

We went out on the bridge. Captain Weeks examined the horizon carefully and then handed us his glasses. It was land, a long, flat line of blue, lying south east of us. We watched it in silence for a while, absorbed in our speculations.

"Do you suppose it can be—?" Captain Weeks asked. But Pretloe shook his head regretfully.

"I'm afraid not, Captain Weeks," he said. "It may be inhabited, but I doubt whether it's any coast we've ever seen before." The Captain thought a moment. Then he looked at us soberly.

"This is our crisis, then," he said. "We'll have to tell the passengers. And the crew."

"Yes." I glanced down at the people promenading on the deck. They hadn't seen the land yet. They thought they were bound for Liverpool, to carry on their private businesses and pleasures, in which each of them was absorbed, enfolded and shut off like a chrysalis in its shell—a private world of his own. For most people the shell never opens except in death. These promenaders, perhaps, had counted the possibility of death as an unforetellable hazard of their voyage; but even death they had not imagined, because men never think of death as a reality. Now they were to face something more than death—a new life, the opening of the shell. From the moment when they should find themselves on land again, they would be no longer John Bealy, the lawyer, and Rudolph Cortez, the master of jazz, and Alicia Corey, the designer of dresses. They would be actors cast in new

róles, on a new stage. Nobody, not even themselves, could tell what they might become.

It was nearing twilight.

"We'll wait," Captain Weeks said. "Later on tonight we'll make for the coast. Tomorrow morning they'll wake and see it. Morning's the best time. We'll tell them then—after breakfast."

We went to supper, hiding our tense expectancy. Nobody observed that we had slackened speed to a bare few knots. We went to supper by candle light.

CHAPTER V

Jamestown, Leaguoa

I ROSE early, a long while before the other passengers, and went on deck. There we were, as Captain Weeks had promised us, cruising along the coast. The land rose abruptly out of the water, and out of little strips of sandy beach. It was a rocky coast, moderately high for the most part, occasionally dropping down toward the water's edge to form a small cove or a length of beach. It showed no signs of human life. There were trees, though, and bushes beyond the sand and at the top of the cliffs. Some distance back a forest began, rising gently to the summit of a low line of hills some miles inland. It was not a very picturesque coast. It looked as if there might be fertile soil on the slopes of the hills. There was something utterly simple and inviting about it. The sea was quite still; waves could be heard breaking unhurriedly on the beaches and against the rocks.

Captain Weeks was on the bridge. I went up and joined him. Sleep seemed to have refreshed him, and he turned to me with a smile less worried than it had been for days.

"You look better, Captain," I told him.

"I feel better," he admitted. "There's nothing to be gained by worrying now. We'll have to make the best of whatever turns up."

I asked him the question I had been pondering over before I fell asleep.

"Can we depend on the passengers? And the crew?

"We can depend on the passengers. They seem to be intelligent people. As for the crew—well, it varies. They're good seamen. Some of them look like pretty rough customers, if it should come to trouble."

We examined the coast line again, Captain Weeks lending me his glasses.

"Looks deserted, eh?" he said. I nodded

"Tell me, Captain," I said, "what resources have we for a Robinson Crusoe act?"

"I don't know. I've been wondering myself; but it's a complicated thing to start a settlement."

"Have we any tools?"

"A few of the rudimentary sort. There are axes, for instance—fire axes, you know. Of course we've hammers—nails—saws. I suppose we've all we'll need."

"Any books—technical books, I mean?"

"None except a few about navigation and ships' engines, and so on."

"Well, we can make out all right, anyhow?"

"Of course." Captain Weeks smiled, and his grey eyes grew hard. "A man doesn't *have* to have anything but his hands, you know."

We steamed on down the coast. We were approaching a point where the line broke and turned inland. A few miles beyond that it reappeared and went on, curving a little before us until it merged into the horizon.

"That looks like a harbor, doesn't it?" I said.

"Or a bay. Some sort of shelter. We'll hope it's navigable—as it should be."

I looked down and saw Pretloe. He was watching the coast line too, but after a moment he turned and came up. Already there were a few people on deck—a tall, middle aged lawyer, John Bealy, the two daughters of Mr. Newton, the banker, and a couple of boys I didn't know. The boys were with Mr. Newton's daughters.

"How do they seem to take it, Mr. Pretloe?" Captain Weeks asked.

"They don't know yet. Mr. Baley has just been assuring me that it doesn't look at all like England."

"And the young people?"

"Apparently don't care where they are."

We paced the bridge in silence, absorbed in thought. The break in the coast line was opening out into what seemed to be a large bay, extending for at least some miles inland. I more than half expected that we should any moment find smoke hovering over it, and see the first signs of a low sky-line such as cities have on the European water fronts. But the bay was deserted. There were no ships at anchor, no docks, no scattered houses nor people bathing.

It was time for breakfast. By now most of the passengers were up and clustered along the rail. We could hear the subdued sound of their voices. They were trying to place the coast, and its unfamiliar harbor. As we went down to breakfast, passing among them, they turned, one by one, and looked hesitantly at us. They wanted to question us, but none had the courage to intrude first. Captain Weeks bowed to them graciously, with a composed smile on his lips, and passed into the saloon. They followed, crowding about the door.

Our table—for by this time I had a regular place at the Captain's table—was the center of attention throughout breakfast. Captain Weeks announced briefly that he would have a statement to make in the main saloon later. We were all very quiet. Most of the passengers hurried through the meal, but the three of us, among a few others, ate in our usual leisurely fashion. We were conscious of an impending crisis, but we preferred to ignore it as long as we could.

I shan't attempt to describe all that took place during our meeting in the main saloon. Basically, it was a public review of the theory—now virtually accepted as fact—Pretloe had worked out for us some days earlier. The passengers sat around in groups and listened. At first they were too amazed and incredulous to appreciate fully how completely they had been cut off from all their old ties and associations. Later, as a realization of the magnitude and weirdness of the situation came to them, they were too overcome with a feeling of unreality to speak or even to think. Captain Weeks was very calm, very courteous, and he did his best to convey the impression that he meant to treat the whole thing in a matter-of-fact fashion. He assured them that we would work out plans and keep in mind the possibility of finding a way back into their world.

"But," he added, "it's better not to put too much hope in that. None of us is responsible for what has happened. If we all determine to coöperate with each other —as we shall have to do for our own salvation—we shall

certainly be able to set up a new civilization which will endure and grow until, eventually, it can adequately replace the old. We have no alternative; and it is useless, of course, to mourn or question what has happened. It is an act of God." With that pious conclusion, he left. Pretloe and I followed.

Later he addressed the crew in much the same manner. By that time we were already advancing slowly into the harbor, being careful to take soundings for the depth. It was a long, wide bay, narrowing at the end opposite the sea into a river which looked navigable.

The three of us, as usual, gathered in Weeks' cabin to discuss plans. It was a fantastic thought, to me, that we were stranded here, like shipwrecks, on a deserted coast, cut off completely from civilization, yet in possession of the one thing no other castaways in the history of the world had ever had—a ship.

"I suppose," Captain Weeks said, "the first thing we shall have to do will be to plant an American flag on the shore." Pretloe shrugged impatiently.

"Why?" he said. "It's about as inaccessible to development as any land I ever saw."

"Still—for form's sake?"

"It would be a futile gesture, since we can't ever hope to open communication again with our government. If we ever should—well, that will be another matter."

"Then what do you advise?" Pretloe smiled.

"It doesn't seem very important to me; but we might give the place a name. One that doesn't smack too strongly of any nation, so that we won't hurt the feelings of any foreigners we may have on board—we need every sort of amity. Then we'd better get on with the business of building a town. We'll make it our own territory for the present."

"Ours personally?"

"The ship's at large. And ours to apportion out so long as we're in command."

I made a suggestion.

"Wouldn't it be a good idea to define the sort of government we're having?"

"Oh, a republic, of course!" Captain Weeks said hastily.

"Or, perhaps, a dictatorship at first?" said Pretloe. "You, after all, are the logical leader. We know we can trust you. You can name a cabinet, and we'll work out our plans together. But we'll need some definite authority for the first few months. . . ."

I don't intend to set down here the details of that long conference. It was a perplexing task to make plans for a community so large as ours. We hardly finished with the preliminary discussions that morning. We agreed finally (with a smile) that it would be simple enough to call our new continent Leaguoa, after the League of Nations, and that plans for a permanent form of government could wait for the present. It seemed advisable for everybody to remain on board, until we had explored the immediate countryside and put up buildings. We could transfer them gradually to the land, and keep the ship as a stronghold against possible aggression by natives. There was very little else the ship would be good for until, perhaps, years later.

In the afternoon, immediately after dinner, we organized a party to go ashore and examine the land about the bay. I think the passengers, most of them, were still too dazed to understand what had happened. A few of them, especially the young people, took the whole thing as an adventure—which, I suppose, in a way it was. Mr. Newton's daughters wanted to go along, but of course Captain Weeks wouldn't hear of it. We took, instead, a Mr. James Folk, who had turned out to be a farmer from the West on his first vacation after twenty years of large scale farming, and the two husky boys I had seen with the Newton girls on the deck that morning. They were college boys of average intelligence, both of them sons of a retired financier who was on board—a Mr. Vance. We had some sailors with us, of course, and we carried revolvers.

We examined the margins of the bay on both sides for traces of habitation while the ship lay at anchor in the river's mouth. There were trees growing nearly to the water's edge, and thickening into a forest further back. The trees were tall and straight, but not very thick. Mr. Folk couldn't precisely identify them. We penetrated a mile or so into the forest, but discovered nothing.

We were on our way back to the ship, coming up the bay, when I made my discovery. The larger trees drew back a little from one point along the shore, as if there had once been a small clearing there, and some young trees had grown in their places, very slender and straight. I thought I saw something, a circular ring and dirty-white, lying under one of the large trees at the edge of the clearing. I left the others, in order to examine it. Nature doesn't grow many plants or animals that are smooth, ring-shaped and white.

It was a life preserver.

I called to the others, and carried it back to them. It had been hanging by a nail to the shore side of the tree's trunk. The cord supporting it had worn through. We carried it down to the water's edge and washed away the caked dry mud and dust that covered it; and underneath we found the inscription. On one side, of course, was the ship's name in faded letters:

THE PACIFIC, NEW YORK

On the other side, in smaller letters, and still more faded, a message had been written crudely with black paint and a brush:

> Jamestown Bay, February 20, 1856. Food low. No relief in sight. Lost 23 days. 54 dead after mutiny. Heading south again.

We looked at each other in silence. 1856—and an American ship. We were not pioneers after all. Captain Weeks scratched his chin thoughtfully, with a puzzled frown.

"The *Pacific*," he murmured. "I've heard somewhere—" Then a light came into his eyes. "Of course! I remember!"

"What is it, Captain?" I asked.

"One of the famous missing ships," he said. "She sailed either from Liverpool or from New York—I've forgotten now—in January, 1856, and was never heard of again."

"A passenger ship?" Pretloe said.

"She carried about fifty passengers—and a cargo valued at two million dollars."

"That explains the mutiny, then."

"Of course. There was a crew of nearly fifty men."

"Was there a storm—anything to explain the disappearance?"

"Nothing at all—no storm worth mentioning. There have been other similar cases too. I've read of dozens,

all authenticated. The *President* and the *City of Glasgow* were lost in the same way around 1850 between New York and Liverpool. A troopship, the *Lady Nugent*, was lost in the Bay of Bengal about the same time with a regiment of Indian troops aboard. H. M. S. *Wasp*, a warship, was lost in 1887 between Singapore and Hong Kong. None of these ships ever left any traces—there wasn't even any wreckage found in their vicinity. There were never any storms of undue proportions, and these were all fine, seaworthy vessels."

"Then," I said, realizing suddenly the significance of these accounts, "it is quite possible that we shall find other colonists nearby?"

"But hardly probable," Pretloe added. "Remember that they must have been bewildered by what had happened, as the *Pacific* seems to have been—" pointing to the life belt, "—and probably went on cruising in search of a civilized port until their supplies gave out. They may have been damaged by storms. Smaller ships than ours, as these must have been, would have suffered severely in such a storm as we encountered, even if it were purely local. In any case, what course they were pursuing after their arrival in strange waters—with regard to the fourth dimension, I mean—may have depended always on chance. There may be hundreds of lost ships and colonies isolated, unrelated three dimensional strata of the earth; but it's unlikely that we shall ever find another in ours."

"Still," said Captain Weeks, "it might be worth while to search some day, in so much as we've a ship at our command. Besides, we'll want to chart our new continent—Leaguoa." Pretloe nodded.

"Of course."

"And incidentally," I remarked, "it seems that our bay has been named for us—Jamestown Bay. I suppose after the first colonists in America." Pretloe smiled, and said:

"I'm glad they had the good sense not to mistake Plymouth for the first English colony in America."

CHAPTER VI

The Distorted City

IT still puzzles me a little to recall how many of our passengers on that voyage were men and women of ability and imagination. It seemed that every soul on board, as soon as he had become adjusted to the change in his life, became at the same moment aware of a hundred suppressed ideals surging confusedly under the surface of his mind. We found ourselves in the midst of potential socialists, reformers, educationalists, Fathers of their Country. It was startling; and then I recalled the enthusiasm with which early English settlers in Virginia and New England had foreseen their visions becoming reality on a virgin soil. But I suppose our colonists have learned, as their fathers did, that a new land doesn't always make a new civilization. They have found that men, wherever they go, carry their old civilizations with them in their hearts—the old prejudices, the old virtues, the old blindnesses. A civilization is only the sum of many people's convictions.

But I was visionary like the rest. I like to think sometimes that possibly our visions are coming true. I can't take the time here to recount in detail all the activity of my few weeks with the colony at the new city of Jamestown. Such an account would fill a lengthy volume. I want to give some idea, though, of what we were planning and what we might have accomplished.

Our idealists were of many sorts. Pretloe, for instance, was a scientist with a mind that had speculated on nearly every phase of human life. He was frantically determined that we should found and build a new civilization governed by scientific principles alone. No haphazard development, he insisted, would do—no vagaries resulting from the conflict of personalities and emotions. For myself, I am an architect. I wanted a city designed from the beginning to care for the most improbable degrees of future expansion. I wanted streets laid out and buildings foreseen that might not become realities for hundreds of years, if ever.

John Bealy, the lawyer, and Charles Newton, the financier, both found themselves to be, without ever knowing it, socialists of a sort. They had discussed their political and economic ideals since their first intimation of what had happened. They discovered a profound conviction that government ownership of business was necessary, in spite of the small fortunes they had privately accumulated in their own investments. They didn't know that this was socialism; they thought of socialism as a process of wandering about naked in the streets and picking up whatever they saw and liked in store windows.

We had a young diplomat on board, Francis Wilson, who had been on his way to Paris as an attaché of the Embassy, with his wife and his young child. Wilson, like his illustrious namesake, had ideals in private which might have astonished his superiors at Washington. He believed in a world-state without tariff barriers or any barriers of language and custom. He frowned on all political systems. He wanted a governmental system under which all executives would be chosen by a method of examinations and intelligence tests, from the state governors up-to the President. With John Bealy, Wilson felt that our whole legal and judicial systems should be developed by the best of competent judges and legal authorities.

As to our practical work—it sounds like child's play compared with these ambitions. Captain Weeks added to the cabinet Bealy, Newton, and Wilson. He got out the crew and set them at cutting trees and building under the direction of his officers and the three students. The buildings were crude, of course, but sufficient for a beginning. A dock was built first, at a point where it was found the ship could come in fairly close to shore. I was drawing beautiful plans, in my leisure moments, of a future city. There was to be a traffic center around the harbor, with docks and termini for railroads and landing fields for airplanes—if we should ever live to build them. I had visions of an elevated drive around the harbor, and elevated streets for private automobile traffic. We *were* dreamers, weren't we?

We put up temporary houses. At the time of my departure a barracks for the crew had been built already—Weeks was imposing military life and discipline on them—and houses for all the married passengers and our only single woman passenger, Alicia Corey, whom I have mentioned earlier in this account. We had, of course, very few passengers—a little over two dozen. The stewardesses were given a house together. The ship was slowly stripped of its furnishings to fill the various buildings. They were luxurious fittings, and they looked very strange in the rude houses we had thrown up so quickly. We

had, too, a building which served as a dining hall and a sort of lounge, with offices for ourselves, and a kitchen. Our idea, you see, was to dismantle the ship as soon as possible. Captain Weeks and his officers, I believe, had plans of their own for the ship, in order that it should be preserved in the best possible condition for the future.

There was a large and varied cargo on board. Ludicrous as it may appear, there were a number of automobiles and trucks, and two airplanes—the latter unassembled, of course. At the time I left, a hangar and a field were being planned for one of the planes. Besides these, there were innumerable other articles—phonographs, beds, bathroom fittings, machinery, etc.—which we used or intended to use as we needed them. We felt that we were entitled to these things under the circumstances, inasmuch as we saw no hope of returning them to their rightful owners. However, a number of the passengers, who were possessed of considerable fortunes, drew up a paper, which they gave Captain Weeks, assuming personal responsibility as a group for the entire cargo, the cost to be taken from their estates in case we should ever return.

In the meantime, our only immediate necessity which could not be readily supplied was food. Our rations were running low. A few wild fruits and berries were discovered in the surrounding woods, but not enough to satisfy the needs of a large group of people. James Folk, the farmer, was making a rapid survey of our resources for various crops. He foresaw the possibility of planting orchards with the fruit trees we had found in the woods. Besides that, he had found among the cargo a consignment of seeds. There was no great variety of these, though, and not enough of them to justify careless experimentation. In any case, it would obviously require months to sow and reap crops sufficient to meet even our most elementary needs. It was fortunately early in the summer, but we were looking forward to an unpleasant winter if other sources of food were not found. It was in one of our expeditions to discover whether there were any animals in the surrounding forests that Jim Grady, Pretloe, and I lost the colony.

The reason I have given even so brief an account of our activity lies in the fact that we were presented with what was so far as I know, a unique problem. We were marooned there in that bay—marooned, too, is an apt word, for the ship was running low of fuel—and we were required to set up as quickly as possible a civilization that would give us as far as it could the comforts of civilization we had left. And our resources were, while limited, amazing for a band of castaways. The significance of our attempt is this, I think: that we were required to manufacture a machine-made civilization. We were the colonists of a new era, of an industrial period. And we went at our problem in a thoroughly business-like manner, with the organization and efficiency that modern business had taught us. The results, of course, are unknown to me now. But it was an experiment nobody had ever had the opportunity to make before.

Grady, Pretloe, and I had gone on several hunting expeditions before the final one which ended the adventure for us. We had found no signs of any life except a few rabbits and other small animals. It had become a matter of necessity to make a thorough search for larger game. So far we had penetrated only a few miles into the forest, being careful not to lose our way.

The final expedition was undertaken with great care. We intended to be gone about a week. We were provided, of course, with food, and we would get fresh water from the river or from any other sources we might find with which to fill our bottles. We carried guns, hatchets, and knives. With the hatchets we should have to mark or blaze our trail whenever we left the river. It was summer, so we carried few clothes and no bedding. Our only extra bodily protection was our raincoats. We had a coil of rope which might prove useful. Our intention was to strike up into the hills, following the river as far as we could.

One morning, after the early breakfast to which we had all become accustomed, we began our journey up the river. Before it disappeared behind a broad bend in the stream, I took one last look at the colony. More than anything else, it resembled the pictures you sometimes see of colonial settlements in Virginia. The row of little houses stretched along the side of the bay, with the big dining hall in the center, where the dock lay, and behind that the barracks. The ship was a fantastic touch. It had seemed a toy ship, leaving New York beside the *Majestic*. Now it looked gigantic, towering up above the long dock and the buildings. For the first time in days I noticed that it had no shadow; but I found that its absence didn't affect me so peculiarly as I might have expected. Mr. Newton's daughters and two or three other young women were swimming in the bay with Rudoph Cortez, the young jazz orchestra leader, who couldn't be persuaded to work. I turned away, and went on up the river.

The hills were not far away. We followed the first branch of the river that turned off on our side of the bank. It led us toward a pass through the hills. By late afternoon we had reached the beginning of the pass. Then a thunderstorm overtook us—the first real storm since that momentous evening our fourth night out from New York. We got out our rain coats and took shelter under the trees until the storm went by. I noted particularly that, while there were flashes of light accompanied by thunder, we saw no actual streaks of lightning. The thunder sounded rather distant.

It was dark afterward, and we couldn't go on without difficulty. We sat down on a big rock at the river's edge and watched the water passing under us, dark and sluggish and quiet, for an hour or so while we talked of our plans for the colony. Then, spreading the coats together on the cold ground, we fell asleep. We were too tired to mind the discomfort.

We were up early, ate our meager breakfast, and went on. The river wound about through the hills, narrowing. When it seemed to be turning back upon itself too much, we left it and started climbing. We had to mark our trail now with our hatchets, which slowed us up somewhat. But the forest was thinning all the time now as we went up, so that we didn't find it difficult to penetrate. Some while after lunch, we reached the summit of a low mountain. It dipped down again before us into a small valley. Beyond that it rose again to another line of hilltops, somewhat higher than these. We had seen no traces of animal life.

We went on. Darkness came as we were starting up the second range of hills. That night we slept on dry twigs beside a small fire that smouldered away during the night. We were no longer afraid that animals might molest us. We had little hope left of finding them. The stillness was profound and disturbing. There were few

of the faint night sounds which make our evenings in the inhabited world, murmurous with hidden life. The silence there was the heavy silence of a vacuum, of a deaf man's world.

The following day we continued our climb. Early in the afternoon we reached the summit, leaving the forest behind except for a few scattered trees and the underbrush. Stretching out before us was a long plain, flat with tall grass waving gently in the wind. We went on.

Tired now, after our long climb, we plodded along with our eyes roving absently over the grass immediately around us. The grass was waist-high. It was late in the afternoon when I happened to raise my eyes and then pause. Some miles away, dim in the gathering twilight, and blurred like a dream, stood the apparition of a city. I rubbed my eyes, and smiled. Certainly there could be no city in front of us. But Pretloe and Grady had paused too, and were looking fixedly at it.

After a long silence, I managed to say breathlessly: "What is it, Pretloe—a mirage?" He looked at me a moment doubtfully.

"A mirage?" he said. "Perhaps. . . ." Then, suddenly, he roused himself. "Come, we'd better hurry on before it's too dark."

We shouldered our rifles and went on, striding forward with long strides that felt all at once refreshed. As we walked, we watched the city looming up before us. The closer we came to it, the more doubtfully we watched it. It was peculiar—the distorted caricature of a city. I can see it still as we saw it in those few hurried minutes of walking. It's clear and distinct in my mind as I write. But I find that I can't describe with any words the strangeness of that startling apparition. Have you ever approached a little one-street village from the rear of the buildings along that street, and at twilight? It was something like that. We could see clearly many streets crossing each other, filled with traffic, squares and boulevards and buildings. And, somehow it seemed that we could see into the buildings, a confused mass of rooms and halls and moving people, people at rest, people coming in and going out. There were thousands of people everywhere, confused as if engaged in a gigantic struggle. But it seemed also that we saw the city in some indescribable fashion from *behind*. It was partly dark, partly hidden from us.

We were very close when a startled exclamation burst from Pretloe's lips—

"My God!" Grady and I paused abruptly.

"What is it, Pretloe? What do you make of this?" Grady asked.

And Pretloe answered, his voice breaking a little: "Don't you see? It's Paris!"

We stood there in silence a moment, staring first at Pretloe, then at the distorted city. Suddenly we began to run breathlessly, shouting, and burst into the city. . . .

As if we had waked up from a dream and opened our eyes, we found ourselves standing on a street corner. The plain with its tall grass waving in the wind was gone. People moved about us, turning their heads curiously as they went by. Automobiles swept along the wide boulevard, quietly in the twilight. For a moment everything seemed very still. Then we became aware of the sound of many voices, and of the hooting of many horns. And at that moment, too, the lights were lighted up and down the boulevard, all together. It was night.

A gendarme approached us, and laid his hand gently on Grady's arm.

"Messieurs?" he said gently, questioningly. And Pretloe, relapsing unconsciously into French, muttered, "Mon Dieu! En vérité, c'est Paris!"

CHAPTER VII

Pretloe's Last Word

THAT'S all. We gave out no statements to the press. We didn't care to see the inside of a sanitarium. We registered at an obscure hotel under assumed names, which we have been using ever since. The thing was simply too incredible to make public. Grady, a quietly observant and methodical fellow, had taken note of all the passengers and their names. Together Grady and I got in touch with their attorneys, and explained in private what had happened. I don't suppose we were believed, but it was a reassurance of a sort. The attorneys presumably did whatever they felt it their duty to do. And Grady explained as well as he could to the owners of his ship. They fired him.

Before I left New York to straighten up my own affairs, I had a last talk with Pretloe at the hotel. He hadn't much to say.

"You can't expect me to explain it," was the sum of his remarks. "Somehow or other we are back, and that's all. My theory? Well, personally I'm getting a little tired of my theories. I'd like a little solid fact for a change. All I can suggest is that when we got out of our stratum we were completely adrift so far as the fourth dimension was concerned. For awhile, probably, we left it behind. Then we must have drifted back. Or perhaps we never were very far away—just far enough away to make the radio and our lights useless. There's no way to tell. Somehow, at the end, we landed with our line (our three dimensional line) converging toward this one, like a straight line converging toward the equator we used to talk about. . . . I suppose the others will wander back, one by one." But, none have appeared.

I must make it clear that we never intended to desert them. You must imagine us as we were that afternoon in the twilight when we saw the distorted shape of Paris in front of us. We hadn't time to think. We saw it; something turned over frantically in our minds, and we ran. When we found ourselves standing on the street corner, in the midst of the crowds, it was too late. There was no way back.

Pretloe has lost himself in a maze of experiments. He is studying his physics all over again. He feels that, with even the meager data our experience gave us, we can eventually find some way back into the waste land where our colony is stranded. He talks of complicated instruments and machines in the rare letters I get from him. Personally, I think it's a waste of time. Besides, it's January now, and I don't know what they're doing for food. Probably they won't even survive.

New York, though, has palled on me of late, as it used to pall on me when I first left Virginia and came here. Secretly I've been wishing I were back in that adventure, with its ludicrous details and its heroic outlines. If Pretloe ever *does* work out his machines, and finds a way to rejoin them, I'll be with him. I can't forget the stillness, and the sea breaking gently on a shadowless beach.

The End

Everything is relative . . . . .

There seems to be very little doubt about that statement. We can't just "move"; we must move in relation to something else. This brings us to the question of "relativity" and Einstein. And in the matter of gravitation. It is very likely that no one will ever know what it is. Acceleration may increase our apparent weight; inertia may do the same, but neither is gravitation. But let Dr. Breuer talk for himself. Unless we very much miss our guess, "The Gostak and the Doshes" is going to create a lot of "distimming." But be sure to read the story when your mind is thoroughly clear and rested. There will be a marked difference in your reaction.

The Gostak and the Doshes

Illustrated by MOREY

By **Miles J. Breuer, M.D.**

Author of "The Book of Worlds," "The Captured Cross-Section," etc.

LET the reader suppose that somebody states: *"The gostak distims the doshes."* You do not know what this means, nor do I. But if we assume that it is English, we know that the *doshes* are *distimmed* by the *gostak*. We know that one *distimmer* of the *doshes* is a *gostak*. If, moreover, doshes are galloons, we know that some galloons are distimmed by the gostak. And so we may go on, and so we often do go on.—Unknown writer quoted by Ogden and Richards, in THE MEANING OF MEANING, Harcourt Brace & Co., 1923; also by Walter N. Polakov in MAN AND HIS AFFAIRS, Williams & Wilkins, 1925.

"WHY! That is lifting yourself by your own bootstraps!" I exclaimed in amazed incredulity. "It's absurd."

Woleshensky smiled indulgently. He towered in his chair as though in the infinite kindness of his vast mind there were room to understand and overlook all the foolish little foibles of all the weak little beings that called themselves men. A mathematical physicist lives in vast spaces where a light-year is a footstep, where universes are being born and blotted out, where space unrolls along a fourth dimension on a surface distended from a fifth. To him, human beings and their affairs do not loom very important.

"Relativity," he explained. In his voice there was a patient forbearance for my slowness of comprehension. "Merely relativity. It doesn't take much physical effort to make the moon move through the treetops, does it? Just enough to walk down the garden path."

I stared at him and he continued:

"If you had been born and raised on a moving train, no one could convince you that the landscape was not in rapid motion. Well, our conception of the universe is quite as relative as that. Sir Isaac Newton tried in his mathematics to express a universe as though beheld by an infinitely removed and perfectly fixed observer. Mathematicians since his time, realizing the futility of such an effort, have taken into consideration that what things 'are' depends upon the person who is looking at them. They have tried to express common knowledge, such as the law of gravitation, in terms that would hold good for all observers. Yet their leader and culminating genius, Einstein, has been unable to express knowledge in terms of pure relativity; he has had to accept the velocity of light as an arbitrarily fixed constant. Why should the velocity of light be any more fixed and constant than any other quantity in the universe?

"But, what's that got to do with going into the fourth dimension?" I broke in impatiently.

He continued as though I hadn't spoken.

"The thing that interests us now, and that mystifies modern mathematicians, is the question of movement, or

I gasped in astonishment. The building was indeed below me. I looked down upon it from an elevation.

more accurately: translation. Is there such a thing as *absolute translation?* Can there be movement—translation—except in *relation* to something else than the thing that moves? All movement we know of is movement in relation to other objects, whether it be a walk down the street, or the movement of the earth in its orbit around the sun. A change of *relative* position. But the mere translation of an isolated object existing alone in space is mathematically inconceivable; for there is no such thing as space in that sense."

"I thought you said something about going into another universe—" I interrupted again.

You can't argue with Woleshensky. His train of thought went on without a break.

"By translation we understand getting from one place to another. 'Going somewhere' originally meant a movement of our bodies. Yet, as a matter of fact, when we drive in an automobile, we 'go somewhere' without moving our bodies at all. The scene is changed around us; we are somewhere else; and yet we haven't *moved* at all.

"Or suppose you could cast off gravitational attraction for a moment and let the earth rotate under you; you would be going somewhere, and yet not moving——"

"But that is theory; you can't tinker with gravitation——"

"Every day you tinker with gravitation. When you start upwards in an elevator, your pressure, not your weight, against the floor of it is increased; apparent gravitation between you and the floor of the elevator is greater than before—and that's like gravitation is anyway: inertia and acceleration. But we are talking about translation. The position of everything in the universe must be referred to some sort of coordinates. Suppose we change the angle or direction of the coordinates: then you have 'gone somewhere' and yet you haven't moved, nor has anything else moved."

I looked at him, holding my head in my hands.

"I couldn't swear that I understand that," I said slowly. "And I repeat, that it looks like lifting yourself by your own bootstraps."

The homely simile did not dismay him. He pointed a finger at me as he spoke:

"You've seen a chip of wood bobbing on the ripples of a pond. Now you think the chip is moving; now the water. Yet neither is moving; the only motion is of an abstract thing called a wave.

"You've seen those 'illusion' diagrams, for instance this one of a group of cubes. (Diagram is on opposite page.) Make up your mind that you are looking down upon their upper surfaces, and indeed they seem below you. Now change your mind, and imagine that you are down below, looking up. Behold, you see their lower surfaces; you are indeed below them. You have 'gone somewhere,' yet there has been no translation of anything. You have merely changed coordinates."

"Which do you think will drive me insane more quickly—if you *show* me what you mean, or if you keep on talking without showing me?"

"I'll try to show you. There are some types of mind, you know, that cannot grasp the idea of relativity. It isn't the mathematics involved that matters; it's just the inability of some types of mental organization to grasp the fact that the mind of the observer endows his environment with certain properties which have no absolute existence. Thus, when you walk through the garden at night the moon oats from one tree top to another. Is your mind good enough to invert this: make the moon stand still and let the trees move backwards. Can you do that? If so, you can 'go somewhere' into another dimension."

WOLESHENSKY rose and walked to the window. His office was an appropriate setting for such a modern discussion as was ours; situated in a new, ultra-modern building on the University campus, the varnish glossy, the walls clean, the books neatly arranged behind clean glass, the desk in most orderly array; the office was just as precise and modern and wonderful as the mind of its occupant.

"When do you want to go?" he asked.

"Now!"

"Then, I have two more things to explain to you. The fourth dimension is just as much *here* as anywhere else. Right here around you and me things exist and go forward in the fourth dimension; but we do not see them and are not conscious of them, because we are confined to our own three. Secondly: if we name the four coordinates as Einstein does, x, y, z, and t, then we exist in x, y, and z, and move freely about in them; but are powerless to move in t. Why? Because t is the time dimension; and the time dimension is a difficult one for biological structures that depend on irreversible chemical reactions for their existence. But, biochemical reactions can take place along any one of the other dimensions as well as along t.

"Therefore, let us transform coordinates. Rotate the property of chemical irreversibility from t to z. Since we are organically able to exist (or at least to perceive) in only three dimensions at once, our new time dimension will be z. We shall be unconscious of z and cannot travel in it. Our activities and consciousness will take place along x, y, and t.

"According to fiction writers, to switch into the t dimension, some sort of an apparatus with an electrical field ought to be necessary. It is not. You need nothing more to rotate into the t dimension than you do to stop the moon and make the trees move as you ride down the road; or than you do to turn the cubes upside down. It is a matter of *relativity*."

I had ceased trying to wonder or to understand.

"Show me!" was all I could gasp.

"The success of this experiment in changing from the z to the t coordinate has depended largely upon my lucky discovery of a favorable location. It is just as, when you want the moon to ride the tree tops successfully, there have to be favorable features in the topography or it won't work. The edge of this building and that little walk between the two rows of Norway poplars seems to be an angle between planes in the z and t dimensions. It seems to slope downwards, does it not?—Now walk from here to the end and imagine yourself going upwards. That is all. Instead of feeling this building behind and *above* you, conceive it as behind and *below*. Just as on your ride by moonlight, you must tell yourself that the moon is not moving while the trees ride by—Can you do that? Go ahead then." He spoke in a confident tone, as though he knew exactly what would happen.

Half credulous, half wondering, I walked slowly out of the door; I noticed that Woleshensky settled himself down to the table with a pad and a pencil to some kind of study, and forgot me before I had finished turning around. I looked curiously at the familiar wall of the

building and the still more familiar poplar walk, expecting to see some strange scenery, some unknown view from another world. But there were the same old bricks and trees that I had known so long; though my disturbed and wondering frame of mind endowed them with a sudden strangeness and unwontedness. Things I had known for some years, they were, yet so powerfully had Woleshensky's arguments impressed me that I already fancied myself in a different universe. According to the conception of relativity, objects of the x, y, z universe *ought* to look different when viewed from the x, y, t universe.

Strange to say, I had no difficulty at all in imagining myself as going *upwards* on my stroll along the slope. I told myself that the building was behind and below me, and indeed it seemed real that it was that way. I walked some distance along the little avenue of poplars, which seemed familiar enough in all its details; though after a few minutes it struck me that the avenue seemed rather long. In fact, it was much longer than I had ever known it to be before.

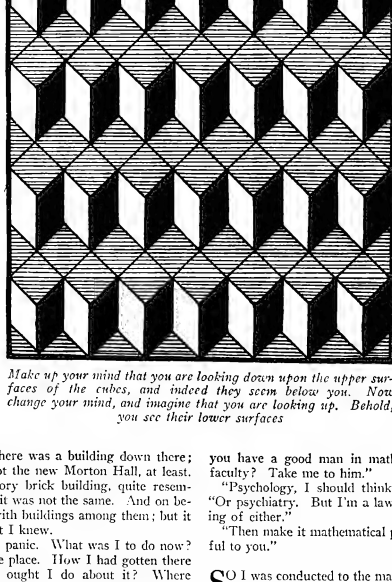
With a queer Alice-in-Wonderland feeling I noted it stretching way on ahead of me. Then I looked back.

I gasped in astonishment. The building was indeed *below* me. I looked down upon it from the top of an elevation. The astonishment of that realization had barely broken over me, when I admitted that there was a building down there; but what building? Not the new Morton Hall, at least. It was a long, three-story brick building, quite resembling Morton Hall, but it was not the same. And on beyond there were trees with buildings among them; but it was not the campus that I knew.

I paused in a kind of panic. What was I to do now? Here I was in a strange place. How I had gotten there I had no idea. What ought I do about it? Where should I go? How was I to get back? Odd that I had neglected the precaution of how to get back. I surmised that I must be on the t dimension. Stupid blunder on my part, neglecting to find out how to get back.

I walked rapidly down the slope toward the building. Any hopes that I might have had about its being Morton Hall were thoroughly dispelled in a moment. It was a totally strange building, old, and old-fashioned looking. I had never seen it before in my life. Yet it looked perfectly ordinary and natural, and was obviously a University class-room building.

I cannot tell whether it was an hour or a dozen that I spent walking frantically this way and that, trying to decide to go into this building or another, and at the last moment backing out in a sweat of hesitation. It seemed like a year, but was probably only a few minutes. Then I noticed the people. They were mostly young people, of both sexes. Students, of course. Obviously I was on a University campus. Perfectly natural, normal young people, they were. If I were really on the t dimension, it certainly resembled the z dimension very closely.



Make up your mind that you are looking down upon the upper surfaces of the cubes, and indeed they seem below you. Now change your mind, and imagine that you are looking up. Behold, you see their lower surfaces

Finally I came to a decision. I could stand this no longer. I selected a solitary, quiet-looking man, and stopped him.

"Where am I?" I demanded.

He looked at me in astonishment. I waited for a reply, and he continued to gaze at me speechlessly. Finally it occurred to me that he didn't understand English.

"Do you speak English?" I asked hopelessly.

"Of course!" he said vehemently. "What's wrong with you?"

"Something's wrong with something," I exclaimed. "I haven't any idea where I am or how I got here."

"Synthetic wine?" he asked sympathetically.

"Oh, hell! Think I'm a fool? Say, do you have a good man in mathematical physics on the faculty? Take me to him."

"Psychology, I should think," he said, studying me. "Or psychiatry. But I'm a law student and know nothing of either."

"Then make it mathematical physics, and I'll be grateful to you."

SO I was conducted to the mathematical physicist. The student led me into the very building which corresponded to Morton Hall, and into an office the position of which quite corresponded to that of Woleshensky's office. However, the office was older and dustier; it had a Victorian look about it, and was not as modern as Woleshensky's room. Professor Vibens was a rather small, bald-headed man, with a keen looking face. As

I thanked the law-student and started on my story, he looked rather bored, as though wondering why I had picked on him with my tale of wonder. Before I had gotten very far he straightened up a little; and further along he pricked up another notch; and before many minutes he was tense in his chair as he listened to me. When I finished, his comment was terse, like that of a man accustomed to thinking accurately and to the point.

"Obviously you come into this world from another set of coordinates. As we are on the z dimension, you must have come to us from the t dimension——"

He disregarded my attempts to protest at this point.

"Your man Woleshensky has evidently developed the conception of relativity further than we have, although Monpeters' theory comes close enough to it. Since I have no idea how to get you back, you must be my guest. I shall enjoy hearing all about your world."

"That is very kind of you," I said gratefully. "I'm accepting because I can't see what else to do. At least until the time when I can find me a place in your world or get back to my own. Fortunately," I added as an afterthought, "no one will miss me there, unless it be a few classes of students who will welcome the little vacation that must elapse before my successor is found."

Breathlessly eager to find out what sort of a world I had gotten into, I walked with him to his home. And I may state at the outset that if I had found everything upside down and outlandishly bizarre, I should have been far less amazed and astonished than I was. For, from the walk that first evening from Professor Vibens' office along several blocks of residence street to his solid and respectable home, through all of my goings about the town and country during the years that I remained in the t-dimensional world, I found people and things thoroughly ordinary and familiar. They looked and acted as we do, and their homes and goods looked like ours. I cannot possibly imagine a world and a people that could be more similar to ours without actually being the same. It was months before I got over the idea that I had merely wandered into an unfamiliar part of my own city. Only the actual experience of wide travel and much sight-seeing, and the knowledge that there was no such extensive English-speaking country on the world that I knew, convinced me that I must be on some other world, doubtless in the t dimension.

"A gentleman who has found his way here from another universe," the professor introduced me to a strapping young fellow who was mowing the lawn.

The professor's son was named John! Could anything be more commonplace?

"I'll have to take you around and show you things tomorrow," John said cordially, accepting the account of my arrival without surprise.

A red-headed servant-girl, roast-pork and rhubarb-sauce for dinner, and checkers afterwards, a hot bath at bedtime, the ringing of a telephone somewhere else in the house—is it any wonder that it was months before I would believe that I had actually come into a different universe? What slight differences there were in the people and the world, merely served to emphasize the similarity. For instance, I think they were just a little more hospitable and "old-fashioned" than we are. Making due allowances for the fact that I was a rather remarkable phenomenon, I think I was welcomed more heartily in this home and in others later, people spared me more of their time and interest from their daily business, than would have happened under similar circumstances in a correspondingly busy city in America.

Again, John found a lot of time to take me about the city and show me banks and stores and offices. He drove a little squat car with tall wheels, run by a spluttering gasoline motor. (The car was not as perfect as our modern cars, and horses were quite numerous in the streets. Yet John was a busy business man, the district superintendent of a life-insurance agency). Think of it! Life insurance in Einstein's t dimension.

"You're young to be holding such an important position," I suggested.

"Got started early," John replied. "Dad is disappointed because I didn't see fit to waste time in college. Disgrace to the family, I am."

What in particular shall I say about the city? It might have been any one of a couple of hundred American cities. Only it wasn't. The electric street cars, except for their bright green color, were perfect; they might have been brought over bodily from Oshkosh or Tulsa. The ten-cent stores with gold letters on their signs; drug-stores with soft drinks; a mad, scrambling stock-exchange; the blaring sign of an advertising dentist; brilliant entrances to motion-picture theaters, were all there. The beauty-shops did wonders to the women's heads, excelling our own by a good deal, if I am any judge; and at that time I had nothing more important on my mind than to speculate on that question. Newsboys bawled the *Evening Sun*, and the *Morning Gale*, in whose curious, flat type I could read accounts of legislative doings, murders, and divorces, quite as fluently as I could in my own *Tribune* at home. Strangeness and unfamiliarity had bothered me a good deal on a trip to Quebec a couple of years ago; but they were not noticeable here in the t dimension.

For three or four weeks the novelty of going around, looking at things, meeting people, visiting concerts, theaters, and department stores, was sufficient to absorb my interest. Professor Vibens' hospitality was so sincerely extended that I did not hesitate to accept, though I assured him that I would repay it as soon as I got established in this world. In a few days I was thoroughly convinced that there was no way back home. Here I must stay, at least until I learned as much as Woleshensky knew about crossing dimensions. Professor Vibens eventually secured for me a position at the University.

It was shortly after I had accepted the position as instructor in experimental physics and had begun to get broken into my work, that I noticed a strange commotion among the people of the city. I have always been a studious recluse, observing people as phenomena rather than participating in their activities. So for some time I noted only in a subconscious way the excited gathering in groups, the gesticulations and blazing eyes, the wild sale of extra editions of papers, the general air of disturbance. I even failed to take an active interest in these things when I made a railroad journey of three hundred miles and spent a week in another city; so thoroughly at home did I feel in this world that when the advisability arose of my studying laboratory methods in another University, I made the trip alone. So absorbed was I in my laboratory problems that I only noted with half an eye the commotion and excitement everywhere, and merely recollected it later. One night it suddenly popped into my head that the country was aroused over something.

THAT night I was with the Vibens' family in their living room. John tuned in the radio. I wasn't listening to the thing very much; I had troubles of my own. $F=g\frac{m_1m_2}{r^2}$ was familiar enough to me. It meant the same and held as rigidly here as in my old world. But, what was the name of the bird who had formulated that law? Back home it was Newton. Tomorrow in class I would have to be thoroughly familiar with his name. Pasvieux, that's what it was. What messy surnames. It struck me that it was lucky that they expressed the laws of physics in the same form, and even in the same algebraical letters, or I might have had a time getting them confused—when all of a sudden the radio blatantly bawled:

"THE GOSTAK DISTIMS THE DOSHES!"

John jumped to his feet.

"Damn right!" he shouted, slamming the table with his fist.

Both his father and mother annihilated him with withering glances, and he slunk from the room. I gazed stupefied. My stupefaction continued while the Professor shut off the radio, and both of them excused themselves from my presence. Then suddenly I was alert.

I grabbed a bunch of newspapers, having seen none for several days. Great sprawling headlines covered the front pages:

"THE GOSTAK DISTIMS THE DOSHES."

For a moment I stopped, trying to recollect where I had heard those words before. They recalled something to me. Ah, yes! That very afternoon, there had been a commotion beneath my window on the University campus. I had been busy checking over an experiment so that I might be sure of its success at tomorrow's class, and looked out rather absently to see what was going on. A group of young men from a dismissed class was passing, and had stopped for a moment.

"I say, the gostak distims the doshes!" said a fine-looking young fellow. His face was pale and strained looking.

The young man facing him sneered derisively:

"Aw your grandmother! Don't be a feeble——"

He never finished. The first fellow's fist caught him in the cheek. Several books dropped to the ground. In a moment the two had clinched and were rolling on the ground, fists flying up and down, smears of blood appearing here and there. The others surrounded them, and for a moment appeared to enjoy the spectacle; but suddenly recollected that it looked rather disgraceful on a University campus, and after a lively tussle separated the combatants. Twenty of them, pulling in two directions, tugged them apart.

The first boy strained in the grasp of his captors; his white face was flecked with blood, and he panted for breath.

"Insult!" he shouted, giving another mighty heave to get free. He looked contemptuously around. "The whole bunch of you ought to learn to stand up for your honor. The gostak distims the doshes!"

That was the astonishing incident that these words called to my mind. I turned back to my newspapers.

"Slogan Sweeps the Country," proclaimed the subheads. "Ringing Expression of National Spirit! Enthusiasm Spreads Like Wildfire! The new patriotic slogan is gaining ground rapidly," the leading article went on. "The fact that it has covered the country almost instantaneously seems to indicate that it fills a deep and long-felt want in the hearts of the people. It was first uttered during a speech in Walkingdon by that majestic figure in modern statesmanship, Senator Harob. The beautiful sentiment, the wonderful emotion of this sublime thought, are epoch-making. It is a great conception, doing credit to a great man, and worthy of being the guiding light of a great people——"

That was the gist of everything I could find in the papers. I fell asleep, still puzzled about the thing. I was puzzled, because—as I see now and didn't see then—I was trained in the analytical methods of physical science, and knew little or nothing about the ways and emotions of the masses of the people.

In the morning the senseless expression popped into my head as soon as I awoke. I determined to waylay the first member of the Vibens family who showed up, and demand the meaning of the thing. It happened to be John.

"John, what's a gostak?"

John's face lighted up with pleasure. He threw out his chest and a look of pride replaced the pleasure. His eyes blazed, and with a consuming enthusiasm, he shook hands with me, as the deacons shake hands with a new convert—a sort of glad welcome.

"The gostak!" he exclaimed. "Hurray for the gostak!"

"But what is a gostak?"

"Not *a* gostak! *The* gostak. The gostak is—the distimmer of the doshes—see! He distims 'em, see?"

"Yes, yes. But what is distimming? How do you distim?"

"No, no! Only the gostak can distim. The gostak distims the doshes. See?"

"Ah, I see!" I exclaimed. Indeed, I pride myself on my quick wit. "What are doshes? Why, they are the stuff distimmed by the gostak. Very simple!"

"Good for you!" John slapped my back in huge enthusiasm. "I think it wonderful for you to understand us so well, after being here only a short time. You are very patriotic."

I gritted my teeth tightly, to keep myself from speaking.

"Professor Vibens, what's a gostak?" I asked in the solitude of his office an hour later.

He looked pained.

He leaned back in his chair and looked me over elaborately, and waited some time before answering.

"Hush! he finally whispered. "A scientific man may think what he pleases; but if he says too much, people in general may misjudge him. As a matter of fact, a good many scientific men are taking this so-called patriotism seriously. But a mathematician cannot use words loosely; it has become second nature with him to inquire closely into the meaning of every term he uses."

"Well, doesn't that jargon mean anything at all?" I was beginning to be puzzled in earnest.

"To me, it does not. But it seems to mean a great deal to the public in general. It's making people do things, is it not?"

I stood a while in stupefied silence. That an entire great nation should become fired up over a meaningless piece of nonsense! Yet, the astonishing thing was that I had to admit that there was plenty of precedent for it in the history of my own x-dimensional

world. A nation exterminating itself in civil wars to decide which of two profligate royal families should be privileged to waste the people's substance from the throne; a hundred thousand crusaders marching to death for an idea that to me means nothing; a meaningless, untrue advertising slogan that sells millions of dollars' worth of cigarettes to a nation to the latter's own detriment—haven't we seen it over and over again?

"There's a public lecture on this stuff tonight at the First Church of The Salvation," Professor Vibens suggested.

"I'll be there," I said. "I want to look into the thing."

That afternoon there was another flurry of "extras" over the street; people gathered in knots and gesticulated with open newspapers.

"War! Let 'em have it!" I heard men shout.

"Is our national honor a rag to be muddied and trampled on?" the editorials asked.

As far as I could gather from reading the papers, there was a group of nations across an ocean that was not taking the gostak seriously. A ship whose pennant bore the slogan had been refused entrance to an Engtalian harbor because it flew no national ensign. The Executive had dispatched a diplomatic note. An evangelist who had attempted to preach the gospel of the distimmed doshes at a public gathering in Itland had been ridden on a rail and otherwise abused. The Executive was dispatching a diplomatic note.

Public indignation waxed high. Derogatory remarks about "wops" were flung about. Shouts of "Holy war!" were heard. I could feel the tension in the atmosphere as I took my seat in the crowded church in the evening. I had been assured that the message of the gostak and the doshes would be thoroughly expounded so that even the most simple-minded and uneducated people could understand it fully. Although I had my hands full at the University, I was so puzzled and amazed at the course that events were taking that I determined to give the evening to finding out what the "slogan" meant.

There was a good deal of singing before the lecture began. Mimeographed copies of the words were passed about, but I neglected to preserve them, and do not remember them. I know there was one solemn hymn that reverberated harmoniously through the great church, a chanting repetition of "The Gostak Distims the Doshes." There was another stirring martial air, that began: "Oh the Gostak! Oh the Gostak!"—and ended with a swift cadence on the Gostak Distims the Doshes!" The speaker had a rich, eloquent voice and a commanding figure. He stepped out and bowed solemnly.

"The gostak distims the doshes," he pronounced impressively. "Is it not comforting to know that there is a gostak; do we not glow with pride because the doshes are distimmed? In the entire universe there is no more profoundly significant fact: the gostak distims the doshes. Could anything be more complete, yet more tersely emphatic. The gostak distims the doshes!" Applause. "This thrilling truth affects our innermost lives. What would we do if the gostak did not distim the doshes? Without the gostak, without doshes, what would we do? What would we think? How would we feel?——" Applause again.

At first I thought this was some kind of an introduction. I was inexperienced in listening to popular speeches, lectures, and sermons. I had spent most of my life in the study of physics and its accessory sciences. I could not help trying to figure out the meaning of whatever I heard. When I found none I began to get impatient. I waited some more, thinking that soon he would begin on the real explanation. After thirty minutes of the same sort of stuff as I have just quoted, I gave up trying to listen. I just sat and hoped he would soon be through. The people applauded and grew more excited. After an hour, I stirred restlessly; I slouched down in my seat and sat up by turns. After two hours I grew desperate; I got up and walked out. Most of the people were too excited to notice me. Only a few of them cast hostile glances at my retreat.

The next day the mad nightmare began for me. First there was a snowstorm of "extras" over the city, announcing the sinking of a merchantman by an Engtalian cruiser. A dispute had arisen between the officers of the merchantman and the port officials, because the latter had jeered disrespectfully at the gostak. The merchantman picked up and started out without having fulfilled all the Customs requirements. A cruiser followed it and ordered it to return. The captain of the merchantman told them that the gostak distims the doshes, whereupon the cruiser fired twice and sank the merchantman. In the afternoon came the "extras" announcing the Executive's declaration of war.

Recruiting offices opened; the University was depleted of its young men; uniformed troops marched through the city, and railway trains full of them went in and out. Campaigns for raising war loans; homeguards, women's auxiliaries, ladies' aid societies making bandages, young women enlisting as ambulance drivers—it was indeed war; all of it to the constantly repeated slogan: "The gostak distims the doshes."

I could hardly believe that it was really true. There seemed to be no adequate cause for a war. The huge and powerful nation had dreamed a silly slogan and flung it in the world's face. A group of nations across the water had united into an alliance, claiming they had to defend themselves against having forced upon them a principle they did not desire. The whole thing at the bottom had no meaning. It did not seem possible that there would actually be a war; it seemed more like going through a lot of elaborate play-acting.

Only when the news came of a vast naval battle of doubtful issue, in which ships had been sunk and thousands of lives lost, did it come to me that they meant business. Black bands of mourning appeared on sleeves and in windows. One of the allied countries was invaded and a front-line set up. Reports of a division wiped out by an airplane attack; of forty thousand dead in a five-day battle; of more men and more money needed, began to make things look real. Haggard men with bandaged heads and arms in slings appeared on the streets; a church and an auditorium were converted into hospitals; and trainloads of wounded were brought in. To convince myself that this thing was so, I visited these wards, and saw with my own eyes the rows of cots, the surgeons working on ghastly wounds, the men with a leg missing or with a hideously disfigured face.

Food became restricted; there was no white bread, and sugar was rationed. Clothing was of poor quality; coal and oil were obtainable only on government permit. Businesses were shut down. John was gone; his parents received news that he was missing in action.

Real it was; there could be no more doubt of it. The thing that made it seem most real was the picture of a mangled, hopeless wreck of humanity sent back from the guns, a living protest against the horror of war. Suddenly someone would say: "The gostak distims the doshes!" and the poor wounded fragment would straighten up and put out his chest with pride, and an unquenchable fire would blaze in his eyes. He did not regret having given his all for that. How could I understand it?

And real it was when the draft was announced. More men were needed; volunteers were insufficient. Along with the rest, I complied with the order to register, doing so in a mechanical fashion, thinking little of it. Suddenly the coldest realization of the reality of it was flung at me, when I was informed that my name had been drawn and that I would have to go!

All this time I had looked upon this mess as something outside of me; something belonging to a different world, of which I was not a part. Now here was a card summoning me to training camp. With all this death and mangled humanity in the background, I wasn't even interested in this world. I didn't belong here. To be called upon to undergo all the horrors of military life, the risk of a horrible death, for no reason at all! For a silly jumble of meaningless sounds.

I spent a sleepless night in maddened shock from the thing. In the morning a wild and haggard caricature of myself looked back at me from the mirror. But I had revolted. I intended to refuse service. If the words conscientious objector ever meant anything, I certainly was one. Even if they shot me for treason at once, that would be a fate less hard to bear than going out and giving my strength and my life for—for nothing at all.

My apprehensions were quite correct. With my usual success at self-control over a seething interior, I coolly walked to the draft office and informed them that I did not believe in their cause and could not see my way to fight for it. Evidently they had suspected something of the sort already, for they had the irons on my wrists before I had hardly done with my speech.

"Period of emergency," said a beefy tyrant at the desk; "no time for stringing out a civil trial. Court-martial!"

He said it at me vindictively, and the guards jostled me roughly down the corridor; even they resented my attitude. The court-martial was already waiting for me. From the time I walked out of the lecture at the church I had been under secret surveillance; and they knew my attitude thoroughly. That is the first thing the president of the court informed me.

My trial was short. I was informed that I had no valid reason for objecting. Objectors because of religion, because of nationality, and similar reasons, were readily understood; a jail sentence to the end of the war was their usual fate. But I admitted that I had no intrinsic objection to fighting; I merely jeered at their holy cause. That was treason unpardonable.

"Sentenced to be shot at sunrise!" the president of the court announced.

The world spun around with me. But only for a second. My self-control came to my aid. With the curious detachment that comes to us in such emergencies, I noted that the court-martial was being held in Professor Vibens' office; that dingy little Victorian room, where I had first told my story of traveling by relativity and had first realized that I had come to the *t*-dimensional world. Apparently it was also to be the last room I was to see in this same world. I had no false hopes that the execution would help me back to my own world, as such things sometimes do in stories. When life is gone, it is gone, whether in one dimension or another. I would be just as dead in the *z* dimension as in the *t* dimension.

"Now, Einstein, or never!" I thought. "Come to my aid, O Riemann! O Lobatchewsky! If anything will save me it will have to be a tensor or a geodesic."

I said it to myself rather ironically. Relativity had brought me here. Could it get me out of this?

Well! Why not?

If the form of a natural law, yea, if a natural object varies with the observer who expresses it, might not the truth and the meaning of the gostak slogan also be a matter of relativity? It was like making the moon ride the tree tops again. If I could be a better relativist, and put myself in these people's place, perhaps I could understand the gostak. Perhaps I would even be willing to fight for him or it.

The idea struck me suddenly. I must have straightened up and some bright change must have passed over my features, for the guards who led me looked at me curiously and took a firmer grip on me. We had just descended the steps of the building and had started down the walk.

Making the moon ride the tree tops! That was what I needed now. And that sounded as silly to me as the gostak. And the gostak did not seem so silly. I drew a deep breath and felt very much encouraged. The viewpoint of *relativity* was somehow coming back to me. Necessity manages much. I could understand how one might fight for the idea of a gostak distimming the doshes. I felt almost like telling these men. Relativity is a wonderful thing. They led me up the slope, between the rows of poplars.

Then it all suddenly popped into my head; how I had gotten here by changing my coordinates, insisting to myself that I was going *upwards*. Just like making the moon stop and making the trees ride, when you are out riding at night. Now I was going upwards. In my own world, in the *z* dimension, this same poplar was *down* the slope.

"It's downwards!" I insisted to myself. I shut my eyes, and imagined the building behind and *above* me. With my eyes shut, it did seem downwards. I walked for a long time before opening them. Then I opened them and looked around.

I was at the end of the avenue of poplars. I was surprised. The avenue seemed short. Somehow it had become shortened; I had not expected to reach the end so soon. And where were the guards in olive uniform? There were none.

I turned around and looked back. The slope extended on backwards above me. Indeed I had walked downwards. There were no guards, and the fresh, new building was on the hill behind me.

Woleshensky stood on the steps.

"Now what do you think of a *t* dimension," he called out to me.

Woleshensky!

And a *new* building, modern! Vibens' office was in

(*Continued on page* 1185)

A Sequel to "The Explorers of Callisto"

Callisto at War

By Harl Vincent

Author of "Microcosmic Buccaneers," "The Seventh Generation," etc.

IN his first story, "The Explorers of Callisto," the author brings us to the other side of the moon, and then quite unceremoniously brings us back to earth without giving us much opportunity to learn about the conditions or the life on the invisible area of our satellite. But Mr. Vincent hastens to redeem himself. Lola, the moon woman, tells us much of what is (according to the author) hidden on the other side of our moon —the side which is an absolute and complete mystery, not even to be surmised about by the best scientists and astronomers. Still, there must be something there. We need say nothing to our old friends about this sequel, but we can recommend "Callisto at War" to our new readers.

Illustrated by MOREY

THE Callistonian maiden, Lola, eagerly scanned the beautiful country-side over which the "Meteor" sped when it reached the earth after its return voyage from the other side of the moon. She thought wistfully of her own home where the foliage was as beautiful as that of the earth if of slightly different color and appearance; thought of the depredations of the blond giants, who had brought about the overthrow of her own people and the death of their king and queen, her parents. Shudderingly she recalled the obnoxious attentions of the light-haired leader of the last expedition from her own world to the satellite of the one she was now to visit. But she gave thanks as she remembered the brave actions of the three earth men who had rescued her from the malevolent chief in that fortress on the desolate globe that was the earth's moon. And when she turned her pretty head from the window, through which she was looking, she cast affectionate glances at the chubby figure of Eddie Dowling, as he bent so intently over the chart upon which their course was plotted.

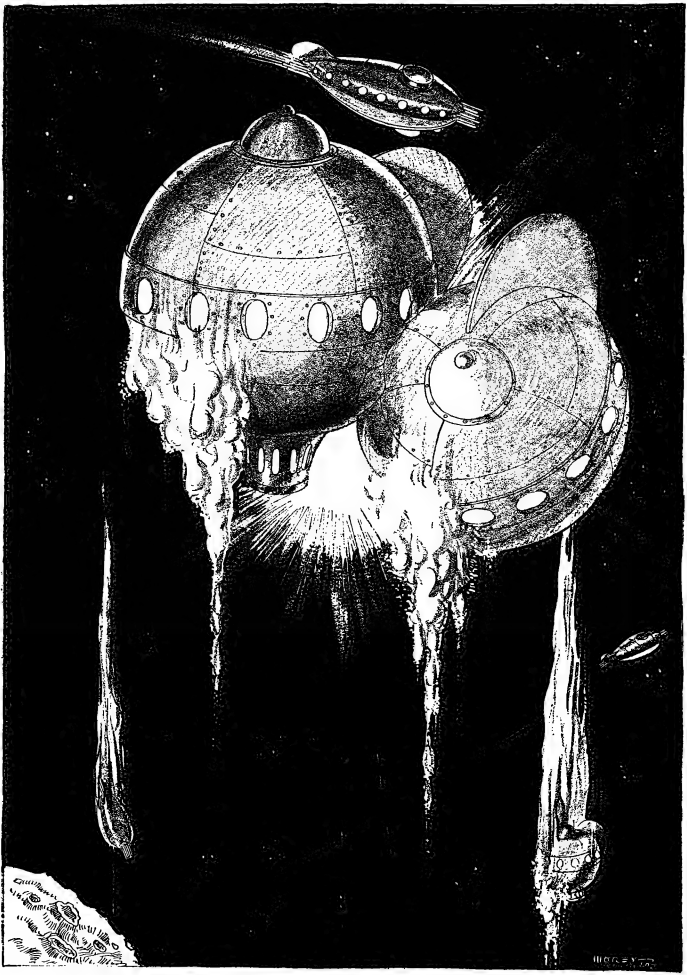
Eddie and his employer, Ray Parsons, were navigating the tiny vessel which had ventured outside of the earth's atmosphere and made the hitherto unaccomplished trip to the moon. Gary Walton, friend and co-worker of Ray, lay asleep in one of the bunks, re-living in his dreams those strange adventures, in which they had become involved on the side of the moon not visible from the earth.

The rocket tubes of the "Meteor" were long since cooled off and the steady purr of the motor in the nose of the ship had taken the place of their intermittent rat-tat, the sound which had assailed the ears of the occupants during the past ten hours. Beneath them in swift succession, there slipped the towns and villages of Connecticut and soon they had passed over the city of New Haven and were following the Boston Post Road, a broad highway black with surface traffic. It was now necessary to reduce the speed of the "Meteor" for they had entered one of the regular air lanes and it was dangerous to exceed the standard speed of two hundred miles an hour as established for the lower levels. In a very few minutes now their journey would be over.

Soon they left the highway and crossed the state line, cutting due west into New York State. When the "Meteor" started circling for a landing in its own enclosure, Lola gurgled with delight. She was to set foot on Tora, the world of peace and prosperity.

With the landing of the craft Gary awoke from his nap and was amazed to learn that he had slept for more than four hours.

Eddie hastened to the air lock and unbolted the outer door, as rapidly as his fingers could manipulate the clamping bolts. All three men were tired, though Gary had been somewhat refreshed by his short sleep. Lola was as fresh as a daisy and could scarcely restrain herself in her eagerness to set foot on the soil of the world of her rescuers.



One of his squadron was caught between two of the spheres when they crashed together.

"What on earth are we going to do with Lola?" asked Ray, as the door swung outward and Eddie prepared to assist her to the ground.

"You just leave that to me now, Chief," was the eager reply. "My house is just a couple of miles down the road as you know, and my mother and sister will welcome her with open arms."

Gary grinned as Lola jumped from the opening into the waiting arms of Eddie, who had preceded them. "And that is about the way you seem to be welcoming her too," he said.

The smiling mechanic flushed to the roots of his hair but was at no loss for a reply. "You bet your life," he averred, "and, believe me, I'm going to hang onto this little girl, if I have to call out the marines to help."

"I'm afraid she will be a very busy little person," countered Ray, who was the last to step from the shiny craft. "You know we are depending upon her to do a great deal in getting this stupendous story across to our people and convincing them that immediate action is necessary for defense against the blond Callistonians."

Lola stood at one side, gazing about expectantly but seeing nothing except the grassy field and the high fence surrounding it. She realized that the men were discussing her, but felt secure in the belief that whatever they decided would be for her good.

"Anyway," Eddie maintained stoutly, "you are all going to stay at my house tonight. It's too late to do anything more today and we all need a good night's rest. Lots of room at our house too."

"You win," laughed Ray, "The invitation is accepted. But I'm not so sure that your mother will be pleased."

"Sure she will!" And Eddie hastened to the door of the enclosure to get out one of the cars.

Ray and Gary exchanged amused glances as Lola followed, almost on the heels of the exuberant mechanic. But they had grave misgivings as they surveyed the scantily clothed figure of the dark haired maiden. She was entirely too pretty and the silver hued garment entirely too snug and sparse to meet with the approval of a matron of the caliber of Eddie's mother. But it seemed that there was nothing to do but to comply with Eddie's wishes, so they trailed in his wake and were soon ensconsed in the rear seat of his ancient gasoline motored car.

When they stepped from the car at the door of Eddie's modest home, Mrs. Dowling rushed across the porch to meet them.

"Sakes alive, Edward Dowling," she said, "where you been?"

Then she stopped aghast at the vision of the radiant girl, whose silver garment glistened in the light of the setting sun with a thousand shimmering hues.

"And bringin' one of them bathin' beauties home with you too!" she continued indignantly.

But when Lola advanced toward her, face wreathed in the sweetest of smiles, she extended her hands. Then, looking deep into the eyes of this girl from another world, she suddenly threw her arms about the slim figure and drew the dark head to her motherly bosom.

Each to His Own Task

THE following day was a bewildering one for Lola, and for Eddie a day of acute misery. For, with their minds alert to the extreme seriousness of the situation, Ray and Gary took things into their hands immediately following the morning meal in the Dowling home. Lucky it was that Eddie's sister took an immediate liking to the girl from Callisto; lucky also that the two were of about the same build, thus making it possible for the earth-girl to provide suitable dress for the young lady who was about to set out on the mission of warning and assisting a world that was in grave danger.

At a hurry call from Gary, the president of the International Communications Corporation despatched his private airplane to carry Lola to the headquarters of the Company in New York City. It seemed to Eddie that no plane had ever traveled so swiftly as that one, and when Lola was hustled inside and whisked away from his sight, his usually smiling countenance took on such an expression of gloom that his mother identified the symptoms at once. But she was wise enough to say nothing, for she knew that her boy must be about his business. He it was who must superintend the overhauling of the "Meteor" for its next voyage. Besides, she was not overly anxious to lose him and certainly this little girl from somewhere out there in the sky seemed quite capable of taking him away.

Lola's impressions of the succeeding few hours were so confused that she could not well have described her experiences, had she been called upon to do so by one who spoke her language. The swift rush to the great city whose entire upper surface seemed to be one huge landing space for aircraft—the rapid descent into a great, magnificent room where a kindly faced earth-man patted her hand, while Ray and Gair-ree spoke rapidly to him in their own peculiar language—the subsequent facing of great blinding lights, where many earth men spoke rapidly before huge numbers of black boxes, and where she was paraded before a succession of mirrors that reflected her own image in the strange costume that was so encumbering—all was so unfamiliar that she did not understand any of it. But these earth people were so kind and so solicitous that she loved them all, and she sensed that the strange proceedings were entirely in the interest of the plan mentioned by Ray on the journey from the earth's satellite. And with every fiber of her tender being she was glad—glad that these people were taking measures in their own defense, and hopeful of the result of this action being beneficial to her own race as well. She could not help but observe the intense energy with which the earth folk attacked their problems and the efficiency of their labors.

With the completion of the ordeal of what she later learned was her official presentation over the world news-broadcast, she thought that her duties were completed for a time. But Lola was to be given very little rest, and she soon found herself in another fast airplane crossing a considerable body of water. At her side was the kindly earth man with the gray hair. This was Horace Greenfield, President of the International Communications Corporation. There were also in the plane two of the men who had rescued her, Ray and Gary. But Eddie had been left behind.

"Gary," said Greenfield, "the effect of the announcements has been tremendous. Before we left New York anxious communications were coming through from all over the world. It was fortunate indeed that the equipment of the "Meteor" included developing tanks and enlarging apparatus, so that you were able to show the pictures along with the verbal report. And the final showing of Miss Lola was a staggering climax."

"Yes, that is true, Mr. Greenfield. And we must thank Ray Parsons for his foresight in so thoroughly equipping his vessel. But I still fear very much for the success of our venture in attempting to get the nations of the world sufficiently interested in this thing to make the preparations we believe are necessary."

"I would not fear for that, Gary. President Cobham, as you know, is a personal friend of mine. We were boys together. And his influence in the present administration is such that Congress dares not oppose him on any important matters. Once the thing is put across in our own country the other nations are bound to follow suit."

"But, interrupted Ray, "there is much to be done. We must first arrange for Lola's session with the telepathists and linguists, so that she will be quickly able to assist in decoding the messages from the lunar base of the enemy. This is by far the surest and quickest means of assuring immediate action in preparation for the war that is bound to come very soon now. I say soon now on account of the recent developments up there on the moon."

"That too shall be taken care of," replied Greenfield. "In all departments of the government I have considered influence and no stone will remain unturned when we reach Washington. Lola shall be taken in hand immediately."

"Poor kid," mused Ray, stealing a glance at the girl who gazed interestedly from the window at her side. "She doesn't know what it is all about, but she trusts us as if she had known us all her life."

"Yes, but she is going to be far happier than she has been in several years when this is all over. And I tell you, young man, that the biggest share of the preparations are going to fall on your shoulders. Our world has forgotten the arts of warfare and it seems to me that even the weapons with which you armed the "Meteor" are insufficient to cope with this enemy if it comes to a conflict of great scope as this will undoubtedly be. As our foremost inventor, you will be confronted with the task of devising adequate armament for the vessels which we are to request the governments of the world to construct."

Ray looked grave. "Yes I suppose that is true, Mr. Greenfield," he admitted, "and it is a task that will require my immediate and whole-hearted attention. But we shall succeed, never fear."

"No doubt of that whatever," came the hearty response. He turned once more to Gary. "And, you my boy," he continued, "must carry on the work of keeping in touch with these code messages and must see to it that the world is kept advised of developments as quickly as we are able to decipher them with the aid of this girl from Callisto."

Gary seemed crestfallen. "But—but, Mr. Greenfield," he objected, "I had hoped to be able to collaborate with Ray here on the more important work."

"Tut, tut, Gary. Every man to his own line. And to my way of thinking the communications end of this problem is every bit as important as any other. Mark my words; that phase of the matter is going to provide the key to the entire situation."

They were approaching Washington and Lola exclaimed with delight at the beauty of the city that spread beneath them. Certainly, in the march of progress, it alone of all American cities had retained its beauty, cleanliness and charm. And, when they landed before the Capitol, it seemed that the entire city had turned out to welcome them.

Lola breathed deeply with excitement when she observed the great throngs about the square and she could have thrown herself into the arms of the kindly little gray haired woman who greeted her at the side of President Cobham, though she knew not that this was the first lady of the land nor that her consort was its chief executive.

Preparing for Defense

THEN came many days of grueling activity for all members of the party which had so short a time ago returned from the moon. To Lola the succeeding events were of such intense interest that she promptly forgot all else; forgot the problems of her own people; forgot poor Eddie. But within six days, thanks to the ceaseless efforts of telepathists and linguists, she was able to converse in English and several of the students had mastered the two tongues of her own Callisto. All who came in contact with the Callistonian maiden were charmed, and it was rumored about official Washington that Eugene Cobham, only son of the president, was desperately in love with her.

Ray had returned to his own laboratory and was resolutely striving to contrive weapons of defense and offense that would be capable of decisively overwhelming the enemy with whom he knew they must deal. In this work he was assisted by his own staff of workmen, including the now changed and morose Eddie Dowling. Eddie had heard some of the rumors that were being circulated in Washington and his rotundity seemed to become less and less apparent as the days passed. More than that, his usual smile was seen no more, but that was not so noticeable, for all the Parsons workmen were working under extreme pressure and there was little time for jocoseness. Ray himself was in unusually bad humor, for the first experiments had come to naught.

Gary organized a special force to classify the tape messages received from the lunar transmitter of the Callistonians and when the Secret Service experts arrived at his office with complete data on the two languages of Callisto, he was ready for them. The labor of working out the code was commenced at once and within ten days this was completed, though it proved to be a stupendous task. Day by day the operatives became more expert and it was soon possible to have the messages decoded, translated and ready for the news broadcasts within one hour after their reception.

A conference of the nations was in progress in Washington and, with the passage of time an agreement was reached and work was begun. At this stage of the proceedings Ray Parsons was called to Washington and there he spent many days in conference with the foremost aviation experts of the world, drawing plans for the war vessels that were to be constructed. Of course, appropriations had been cut to the bone, so that by the time the diplomats were finished with the plans, the number of vessels to be built had dwindled to a mere thirty, ten of which were to be constructed in the United States. Ray shrugged his shoulders at this news but resolved that the thirty ships should be so well armed as to prove a match for any fleet the Blond Callistonians might be able to muster. But when he finished with the other designers and the plans of the new war ships were completed, he was no nearer the solution of the arma-

ment problem than he had been previously. True, the new ships were to be provided with the various energies used by the "Meteor" and the generators of the energies were to be of far greater power. But a real, invincible weapon was still to be discovered.

All over the world industry was drafted for the work of turning out the thirty vessels in the shortest possible time. In this influence of Horace -Greenfield pre dominated. He it was who organized the financiers of the world and laid down the law to them. It was his influence with President Cobham that brought about the various conferences in which international agreements were ratified, and it was he who kept the news broadcasts constantly filled with the right sort of propaganda. The messages from the moon played no small part, for each day revealed a new development in the plot of the enemies of the world. Excitement prevailed throughout the globe as it became apparent that a preliminary sortie was being planned by the enemy.

Before Ray left Washington to return to his own laboratory, he attempted to visit Lola but was extremely disappointed on learning that she was too busily engaged with social functions to grant him an audience. And the rumors concerning Eugene Cobham persisted. But at least he would not apprise Eddie of this fact. That would be entirely too much of a blow at the present time, he thought.

Upon his return to the laboratories in Monroe County he was surprised at finding Gary awaiting his arrival.

"Just took a couple of days off," was his friend's greeting. "Old Greenfield thinks I need a rest and I thought I'd come up here and pal around with you a bit. Heard you were leaving Washington today so I beat you to it in getting here."

"Glad to see you, old man," replied Ray wearily but earnestly, "but I'm afraid you won't get much rest. This question of armament must be settled pronto so I'll be working day and night. Of course that doesn't mean you have to be on the job but, knowing you as I do, I am darn sure you will be, whether I want you to or not."

"Right," grinned Gary, "and that's just what I want. I'm so sick of looking at the tapes and listening to the translators that I could fly. The change will be the rest I need. How's Lola?"

"Hush." Ray looked to see if Eddie was within hearing. "The darn kid's had her head turned with all the fuss they've been making over her and it's pretty sure she's running around with young Cobham quite steadily. Mustn't let Eddie know, but she wouldn't even see me."

"Fiddlesticks! That girl's head is never going to be turned. She's too smart. The only trouble is that they have been rushing her so that doesn't know what to do about it. Don't forget that all of this is entirely new to her. She'll get over it."

"Hope so. Anyhow, what do you say we quit gabbing and get to work on this armament business."

"Right."

So the two friends once more started work on a knotty problem and when Eddie Dowling offered his services in the particular work, Ray dismissed him rather curtly and ordered him to complete the overhauling of the "Meteor" and the restocking of the ship for a much longer voyage. He turned his head resolutely from the hurt look in Eddie's eyes.

"Whew! Glad that's over," he exclaimed, when the crestfallen mechanic left them, "Poor old Eddie is eating his heart out over Lola and I just can't stand it to watch him. Besides I think we are going to need the old 'Meteor' on this job."

"What? You think she can make the trip to Callisto?"

"Why not? We don't have to carry any more of the concentrate than we did on the trip to old Luna and as far as Parsonite goes, she carries enough to send her to the edge of the solar system and bring her back too. Of course there is the question of increased speed, but that is being taken care of now."

"The new ships will be faster?"

"Nearly a hundred times as speedy, Gary."

"A hundred times! Is that possible? Is it necessary?"

"It is easily possible. I have merely redesigned the rocket tubes to provide the proper expansion ratio on which I previously erred. There will be a greater number of tubes also—in fact, we are adding six to the 'Meteor.' And the increased speed is of vital importance, unless we want to spend a year or more in making the trip to Callisto."

"Great Caesar's ghost! Is it that far?"

"You bet. Jupiter is 483 million miles from the sun, and the satellite Callisto is one and one-sixth million miles from its parent body. The earth is but 93 million miles from the sun, and our own moon, which we recently visited, is a little less than a quarter of a million miles from us. So you can see the ratio of distances. Even with Earth and Jupiter in their present positions with relation to the sun, which is nearly as close as the two planets approach each other, the distance is well over 400 million miles and a speed of something like seventy thousands miles a minute for the entire trip average will be required to reach our destination in four days. That is the mark I am shooting at and I have calculated a maximum speed for the new vessels and the remodeled 'Meteor' of better than a hundred thousand miles a minute, with a practical cruising speed of eighty-five thousand."

"Wow! That's going some!"

"It is that. But we'll need all the speed we can get, to my way of thinking, when things start popping."

"Are the new ships to be constructed along the same lines as the 'Meteor'?"

"Pretty much, with the exception that their wings, landing gears and propellers, which are used only for flying under atmospheric conditions, will be so arranged that they may be folded out of sight and completely protected within the insulated hull. That will prevent these parts being destroyed during an engagement with the enemy. In addition the new ships will be much larger than the 'Meteor.' But here—this talk isn't getting us anywhere on the question of a super-weapon."

The Tellurians' Defence in Space

GARY'S so-called vacation stretched into ten days and their labors had produced less than nothing in the way of that invincible weapon for which they were searching. At the end of the ten-day period it was necessary for Gary to return to New York and Ray was at almost his wit's end. He was constantly besieged with urgent radiophone requests from the government for news regarding the results of his investigations. Annoying calls from antagonistic scientists, who sought only to renew some of the old quarrels they had with him, served further to irritate and exasperate him. He shut himself

up from all callers after a few experiences of this sort and worked harder than ever. They would not down Ray Parsons!

Meanwhile the thirty vessels were well under way in various parts of the world. Parsonite was being manufactured in huge quantities in order that the rocket tubes of the new ships might be well supplied. The concentrated fuel for the internal combustion engines was likewise being refined in large quantities, and was stored in great tanks that were erected at several ship yards. Oxygen generators, carbon dioxide absorption apparatus, generators of the paralyzing and fusing high frequency currents, and other required portions of the ships were being built with all possible speed and shipped to the yards for installation in the vessels. But still there was no superarmament.

Then came the day when the world was stunned by the news that a fleet of the Callistonian vessels was scheduled to make an experimental raid on the earth within the next forty-eight hours and Ray's radiophone was kept constantly busy. What are we to do? This was the cry from the four corners of the globe. And, despite the seriousness of the situation, Ray was constrained to make merry over some of the frantic communications from his erstwhile critical colleagues. To each and every inquiry he made the same reply. The fusing and paralyzing ray generators were to be installed in any sort of aircraft that would carry them, and the observatories were to keep constant watch of the heavens for the approach of the attacking ships, when a defense was to be made, with the improvised fleet after the enemy vessels entered the earth's atmosphere. Secretly he determined that the "Meteor" would be on hand when the time came.

Further messages, when decoded, revealed that the raid was to made by eight of the huge spheres from Callisto, and that these were already assembled at the lunar base. Fortunately the messages likewise revealed the points of intended attack, so it was a comparatively simple matter for the Tellurians to concentrate their meager armament at the expected localities. But the time was short and the panics that resulted in the various cities where attacks were anticipated resulted in serious privation and considerable loss of life. There was no doubt as to the objectives, for the messages indicated clearly that the largest cities of the several continents were chosen. New York, Chicago, Philadelphia, Paris, London, Berlin, Tokio and Osaka were undoubtedly the cities under fire, each to be attacked by a single sphere. The exodus from each of these centers was overwhelming and the authorities could not handle it. Engineers and mechanics labored day and night, transporting the sixteen generating equipments which had been completed, and installing them in the fastest commercial planes that could be requisitioned. There were three at New York, two at each of the other cities excepting Osaka, which was unfortunate in being able to obtain but one.

Early in the morning of the second day the news broadcasts reported that the fleet of eight vessels had been sighted by various observatories and that they were approaching the earth at a distance of less than one hundred thousand miles. Ray decided that it was time for action and he dropped his work and hurried to the "Meteor".

"Eddie," he said to the surprised mechanic, "is she ready for the air?"

"Never better Chief. Where to?"

"You heard about the fleet that is coming to attack?"

"Sure, on the broadcast last night. What of it?"

"They have been sighted, and we are going out to meet them."

"Hot stuff! Let's go!" Eddie was himself once more and he bounded through the air lock as if on springs.

Ray grinned delightedly as he clamped the outer door. Good old Eddie, he thought, he'd get over this foolish love affair.

Eddie started the motor and in less than a minute the "Meteor" was roaring out over the tree tops and climbing rapidly into the rare air regions, The ship operated without a hitch and seemed to sense that it was being called upon to make an extra effort. The earth fell away from them. The acceleration compensators were taxed to the limit and Ray felt himself pressed into his seat with painful force. He corrugated his brow in thought. This gravity thing might offer a solution of the armament problem—if he but knew how to adapt it. Then he promptly forgot the glimmering of an idea that had come to him, for he noted that they were traveling at the rate of two thousands miles a minute.

"Ease up there, Eddie," he ordered, "they're only a hundred thousand miles out. We'll overshoot the mark."

With the answering tattoo from the forward rockets and the resulting deceleration, he was lifted from his seat and found difficulty in maintaining his equilibrium. Once more came that hazy forming of an idea, only to be dashed from his mind by a shout from the excited Eddie.

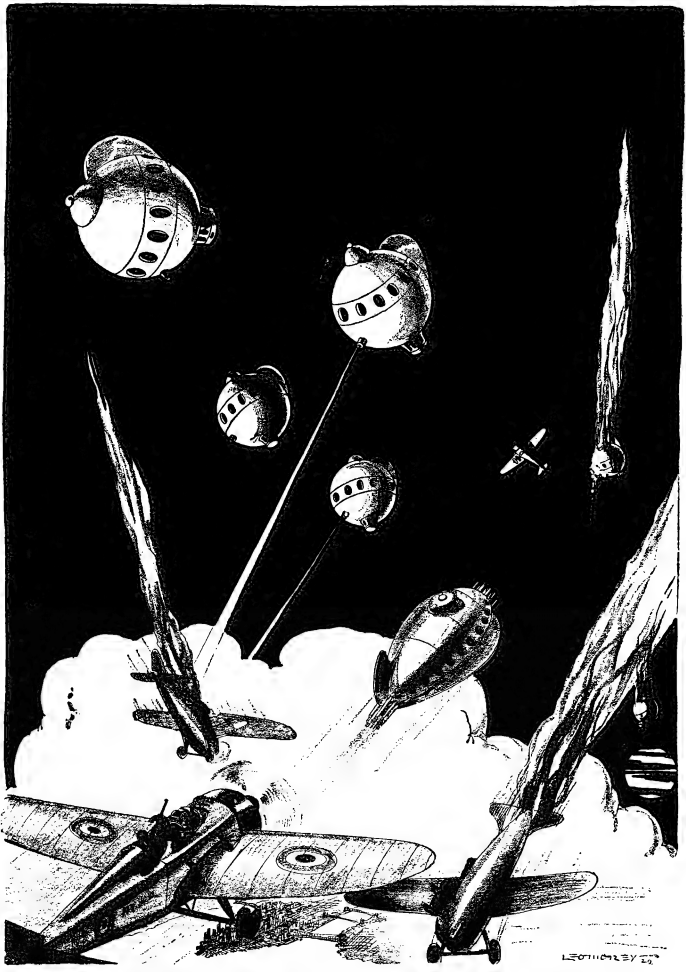
"There they are, Chief! Over to the right!"

It was true and they were rapidly passing the massed fleet of the Callistonians, but at a considerable distance. The "Meteor" had now slowed down considerably and Eddie manipulated the controls to swing the ship about in a wide arc. The stuttering of the explosions in the rocket tubes was almost continuous for a few seconds and then they were on the back trail with the eight spheres of the enemy in formation far ahead and barely visible in the periscope screen. The "Meteor" drew rapidly nearer and Ray started the generators of the fusing beam.

"Now Eddie," he said tensely, "just approach slowly until we are only a few miles to their rear. Then keep that position."

He chose the rearmost of the eight spheres and, when within range, searched its vitals with the destructive ray from the machine at which he stood. For a minute there was no result. Then he recalled the effect previously obtained on one of the protuberances of a similar vessel. He made out the bulge of such a protuberance and directed the ray at this point with immediate effect. The knob-like appendage flattened to the level of the surrounding metal and very quickly a large jagged opening appeared where the deadly beam contacted with the hull.

"One!" exulted Ray. But his triumph was short lived, for the formation of the enemy ships changed at once, two of them dropping out of formation and five increasing their speed in the direction of the earth, which now appeared as a great, spotted green ball that nearly filled the heavens. The damaged sphere wobbled uncertainly and went reeling off into space. But the two spheres which had fallen behind turned to attack the tiny "Meteor."



It was the "Meteor" which darted after the spheres at a speed double that of the spheres

"Now, we are in for it!" grunted Ray, "Keep a close watch on the controls, old man, and I'll tend to this beam."

Eddie needed no further instructions, for when he saw that the two spheres were separating and maneuvering to attack from opposite directions, he shot the "Meteor" to one side so swiftly that she came up under one of the big vessels and gave Ray an opportunity to get in an immediate shot at the lower prominence on the hull. The beam took effect very quickly, but not before that shimmering yellow ray had been released by the enemy vessel. It struck the "Meteor" amidships and, as had happened in the encounter over the surface of the moon, the temperature rose rapidly in their small cabin. Simultaneously the electrical system of the "Meteor" became completely paralyzed and Ray groaned in despair. Meanwhile the second sphere was swinging about to get within reach of the tiny vessel that had attacked its sister ship. Eddie worked frantically with the controls but to no avail. Then, as suddenly as it had appeared, the yellow beam vanished and soon the answering tattoo of the rockets told of the release from the energy it carried. The "Meteor" shot into space with tremendous velocity.

"Another close call, Eddie," shouted Ray as he wiped the perspiration from his face. "Now get the other."

But the second sphere was vanishing rapidly in the direction of the earth, which suddenly loomed very close. Ray glanced at the distance indicator.

"Good Lord, they've gotten away," he exclaimed. "Only ten thousand miles to go and we can't possibly overtake them in that short distance. Well, we accounted for two of them and the only thing we can do is return to New York and help out there."

So the little "Meteor" was hurled earthward to enter the battle which must surely have commenced by this time.

The World's Largest Cities in Danger

OVER the great city of New York there circled three large steel monoplanes, each powered by six motors of tremendous size. These were the highest speed standard planes obtainable and were capable of traveling at five hundred miles an hour at twenty thousand feet altitude. Each was equipped with a fusing beam generator and was manned by ten picked members of the police force in addition to an expert pilot and two mechanicians. These planes were not insulated as was the "Meteor," so instructions had been issued to fight the battle at as long range as possible in order to keep away from the yellow beam of the invader and from the powerful magnetic energy, concerning which Ray and Gary had reported.

When the gigantic sphere of the Callistonians appeared over the lower portion of the city, its polished surface gleaming in the midday sun, the three defense planes circled faster and faster, climbing rapidly to a point where they were enabled to attack the monster. Seemingly unmindful of its small tormentors, the great sphere sank speedily to a point directly over the Municipal Building, where the yellow ray was put into operation. The tall building crumbled into the surrounding area like a mass of molten paraffine, the white-hot materials flowing along the surrounding streets like lava from a volcanic eruption. Above the spherical vessel the three planes, darting like gnats, tried out their fusing beams on its upper surface. Two more of the yellow rays sprang into action from above and two of the steel ships of the defenders came crashing into the streets, their ignition systems paralyzed and the cabins heated to incandescence. The third, more fortunate than the others, banked sharply and circled the great sphere at so rapid a rate as to make it impossible for the attackers to keep their yellow rays in contact with its steel body. But, by reason of the great speed, it was likewise impossible for the defense plane to get results from its own fusing beam.

It was at this moment that the "Meteor" arrived on the scene and the hitherto hovering sphere rose rapidly to a greater altitude, evidently preferring to battle the new adversary where greater freedom of movement was permissible. The steel plane followed, but was unable to climb as rapidly as the "Meteor," which darted after the sphere at a speed double that of the Callistonian sphere. Ray struck for the vulnerable lower protuberance with his fusing beam, but was too late. The yellow ray had struck first and the engine of his vessel went dead. Simultaneously the generator of the fusing beam ceased operating and the "Meteor" was helpless under the fire of the enemy vessel. But the insulating hull of the "Meteor" saved them for an instant and this was just sufficient time to permit of the steel plane coming to the rescue. Fortunately the inexperienced operator of the beam aboard the steel plane chanced to direct his energy into the very protuberance, where it was most effective, and the day was saved for New York City. Evidently the controls of the vessel were located in this lower bump, for the great ship immediately commenced its wobbling descent and was soon lost in a cloud of dust which arose upon its crashing into a great section of the east side of lower New York, where all beneath it was demolished.

Then Ray turned on the broadcast receiver of the "Meteor" and picked up the international news service. The world was aghast. The first word to greet them was to the effect that one of the spheres of the invaders had laid waste nearly half of the city of Chicago before departing. Berlin was in flames at a dozen points and its attacker had also left for regions unknown. Paris and London had shared like fates. Tokio and Osaka escaped entirely, thanks to the destruction of the two spheres outside the earth's atmosphere. But Philadelphia was still under fire so, with the "Meteor's" motor once more functioning normally, Ray directed Eddie to proceed there with all possible speed. Within fifteen minutes they were circling the smoking ruins of a great section of the third largest city in the United States. Glancing skyward they saw the vanishing bulk of the Callistonian vessel which had so seriously crippled the Quaker City and taken such widespread toll of its population.

"After them, Eddie!" growled Ray. And once more the "Meteor" shot skyward.

But the great sphere was fast and it was many minutes before they approached within range of the fusing beam. Then the most disheartening of all experiences occurred, for the yellow ray of the enemy struck them before their energy could be used and once more the "Meteor" went absolutely dead as far as operation of the electrical equipment was concerned. The enemy had learned how to combat them!

Fortunately for the "Meteor" and its occupants, the

enemy ship did not attack. Satisfied that the yellow ray had crippled the small attacking ship, the great sphere proceeded on its swift way toward the lunar base, leaving the "Meteor" to drift helplessly in space until the effects of the bombardment had worn off and the ignition system once more could be used. When the rocket tubes again fired, the spherical vessel had entirely vanished, and Ray ordered Eddie to head for home. Discouraged beyond measure, he closed his eyes and racked his brains for that elusive idea, that had been almost within his grasp in the morning. Finally he gave up what was obviously a futile attempt.

When they returned to the laboratory they found a delegation awaiting them, a committee from Washington. Long faces confronted them and Ray's spirits sank to the lowest level they had reached since the beginning of the trouble.

"Gentlemen," he addressed them wearily, "I am fully aware of the reason for your visit, though the details of the disaster to our world are still unknown to me. You have come to me to learn whether I have discovered a super-weapon, have you not?"

"Yes," replied the chairman of the committee, "and it is an extremely serious matter, Mr. Parsons. Perhaps you do not know that our defenses failed in all excepting the one instance, that is, over New York City. And, even here, the steel plane would have failed had it not been that your own ship was occupying all of the attention of the enemy. You witnessed the destruction in Philadelphia, but perhaps you do not know that five other great cities of the world have met a like fate. Our present weapons are inadequate, since even with the new vessels insulated as is the 'Meteor' we still have no assurance of victory over a superior force. Something must be done immediately."

"Yes I know. But I am no magician, you know. And I must remind you that I want to be left alone and must have absolute quiet if I am to work out our salvation. I shall do my best, but that is all I can promise you. No man can do more."

"We realize that," admitted the chairman," and we likewise realize that scientists throughout the entire world have been at the same problem, endeavoring to solve it themselves to your discredit. These scientists are still unsuccessful and we have come primarily to assure you that the governments of the world are placing their confidence in you as the one man who can get them out of this unexpected dilemma. We offer every assistance, financial or otherwise, that you may require for your success."

Ray brightened somewhat. "Thank you gentlemen," he said, "I appreciate the honor, as well as the offer of assistance. But my means are entirely sufficient to carry out the work and I have an extremely capable force of assistants. More would simply be in the way and would retard rather than hasten the work. Now, if it please you, will you kindly leave me to my work and carry back to the world the assurance that everything possible will be done. It is not necessary for me to say any more."

The chairman bowed and, after some desultory conversation, the committee left.

"Confound them all!" exclaimed Ray. "Can't they leave a man in peace?"

Then Ray Parsons did an unprecedented thing. He went to bed and, in sheer exhaustion, slept for more than twenty hours.

Artificial Gravity

GARY WALTON paced the floor of his office, listening apprehensively to the voice of the newsbroadcast announcer as the casualty lists were being read. The destruction and loss of life had been of vast extent and the world was in an uproar. Something must be done to speed up the work on the thirty space fliers and to provide adequate means of combating this enemy from out the skies. Worst of all there came widespread criticism of the seeming inactivity of Ray Parsons and of his failure to provide a suitable weapon of offense.

"Fools!" snorted Gary, "Don't they realize that everything that has been done is due to his efforts and that he really saved New York City from the worst disaster of all? Haven't they sense enough to know that except for Ray, we should have been entirely unprepared and that these eight ships would probably have remained here and continued the work of destruction until it was complete? Such ingratitude makes me sore!"

Then there came from the broadcast receiver a message that had been translated within the past half hour; one of the intercepted messages of the Callistonians. How the enemy gloated! It was true that they had lost two of the eight ships, but they reported that the world was a defenseless one, unprepared and ready for the slaughter. Just one tiny vessel they reported as able to cope with them at all and they bragged that successful means of fighting this lone ship, the "Meteor," had been discovered. How discouraged Ray must be if he listened to all this rot, thought Gary. And he stamped from his own office to that of Horace Greenfield in high dudgeon.

"I'm resigning, Mr. Greenfield," he stated bluntly, when he faced his superior.

The great executive looked at him with a twinkle in his eyes. "You are, eh?" he countered. "And suppose I refuse to accept your resignation?"

"You must accept it." Gary's tone was stubborn. "I'm all fed up on this communications business at a time like this. I simply can't stand it. If I can't be out doing something worth while, I'll go crazy."

"How would you like a leave of absence instead?"

"Oh, that would be great. But I hesitated to ask for it."

"You may have it, my boy, for as long a time as may be necessary. And at full salary too. The work here is so well organized now, that it can go on uninterrupted, and I see no reason why you should not go up there in Monroe County and work with your friend Parsons. I know very well that such a procedure is what has been on your mind."

"That's it, Mr. Greenfield. It galls me to hear all this unwarranted criticism of Ray and I wish to be with him to help in any small way that I can."

"Very natural Gary. Can't say I blame you at all. And now go ahead and run along before I change my mind."

So it was that Gary reached his friend's laboratory within an hour of the time when he awakened from his long sleep. He was astonished beyond measure to find Ray in a great state of excitement, issuing orders right and left among his corps of engineers.

"Just the fellow I wanted to see," Ray greeted him, "You can dig right in and help too. I've solved the problem of a weapon—dreamed it, by George!"

"Dreamed it?"

"Well partly. I had a hazy idea in the formative state, when I fell asleep, but found it fully developed when I awoke. It's a cinch, but we must hurry in order to get the necessary equipment out in time."

"What on earth is this big idea?"

"Come in to my office and I'll tell you all about it. The gang is all primed up now and is going to get busy at once."

They repaired to the office and Ray sank into his chair with a contented sigh. Gary was pleased to see that his friend had recovered his usual poise and confidence.

"Artificial gravity," said Ray solemnly, when they had lighted their cigars, "That is the big idea. You know how simply I have been able to increase the force of gravity in the appliances on the 'Meteor?'"

"Yes, but how are you to apply that in this case?"

"Listen. It's so simple, it's foolish. For years I have been trying to overcome gravity, as have many others of our scientists. But none of us has been successful. However I have learned how to increase it—how to produce an artificial gravity as is done on the 'Meteor.' The acceleration and deceleration compensators operate on the same principle. And the force by which these results are produced can be set up in metallic objects from a distance by means of a definite high frequency current sent over a ray of etheric vibrations. Come over here and I'll show you."

He led his friend to the adjoining room, where there was a huge Coolidge tube and its accompanying apparatus. "Watch this," he said gleefully.

The closing of a switch on a nearby panel lighted the heater element of the tube and Ray adjusted a small reflecting mechanism at the side of the apparatus until a faintly discernible ray of purplish light impinged upon a block of steel which reposed on a small empty packing case. Nothing happened for a moment and Gary looked questioningly at his friend.

"Wait!" said Ray.

They watched the steel cube in expectant silence. Then something did happen; something so astonishing to Gary that he gasped in amazement. The rough pine boards of which the packing case was constructed sagged lower and lower until, with a sharp crack, they gave way and allowed the steel block to fall to the floor beneath. There was another crash and a thud as of a tremendously heavy object striking the concrete floor of the basement. The cube had gone through and buried itself in the concrete, leaving a gaping opening in the floor boards!"

"Great Caesar!!" ejaculated Gary, "that is a stunt, old man!"

Ray grinned delightedly at his friend's expression. "Yes," he admitted, "and it is just the stunt that is going to put the Callistonian space fliers out of business."

"But how?"

"Don't you see? That piece of steel, weighing normally about thirty pounds, has been increased in weight by the action of this ray until something like ten or fifteen tons were concentrated on its narrow base and the supports failed. What I propose is that generators of this ray be installed on the 'Meteor' and on a few of the larger new ships for use against the enemy vessels. If we encounter them near the surface of the moon or of their own planet it will be possible to send them crashing to the ground. In case we encounter them in space they will crash into each other, due to the greatly increased mutual attraction."

"But will not this increased attraction cause our own ships to crash into those of the enemy as well?"

"No, for the hulls of our vessels are constructed from materials which insulate them against this artificial gravity field. There is no question about it; we have them where we want them now, provided we are in time."

Gary grabbed him by the shoulders and executed an impromptu war dance about him. "Glory be!" he shouted. "You've done it again! And won't the old fossils be sore?—the ones who have been knocking you?"

Then there came a startling interruption, for with a pattering rush of tiny feet a slight feminine figure dashed across the room and soft, warm arms were flung around the necks of the two men. It was Lola!

"Oh Ray—oh Gair-ree," she sobbed, "Lola is so unhappy. She has missed her dear friends so much when in the great city you call Wash-ing-ton. Where is Ed-dee?"

Over the top of the girl's head Gary winked at his friend. "What did I tell you?" he said. "Lola is one little bit of all right."

Ray gazed blankly at his friend and at the flushed and panting girl. Where indeed was Eddie? He had not seen him since the last trip of the "Meteor;" since the battle. He rushed to the telephone and soon had Mrs. Dowling on the wire. There was a catch in her voice when she replied to his inquiries.

"My boy has packed his clothes and gone away, Mr. Parsons," she moaned. "Feelin' bad about that Miss Lola, I think he was, and he wouldn't tell me where he was goin' either. It's just sick at heart I am about it too."

Ray turned from the instrument and faced Lola with a sinking heart. He dared not tell her the truth, yet he knew that she must soon know. So he broke the news as gently as possible.

"Eddie has gone away," he said gravely.

"Gone away?" The girl's eyes were tragic with fear. "Where?"

"We do not know."

Lola dropped weakly into a chair and covered her face with her hands. "Oh, oh," she lamented. "It is that he thought Lola no longer cares. And Lola is to blame. Poor Ed-dee! Unhappy Lola!"

A Stowaway

DURING the succeeding weeks the news broadcasts carried different tidings to the peoples of the world. Ray Parsons was once more an international hero. The construction of the thirty vessels was being rapidly rushed to completion. Twelve of the fusing-beam generators intended for the new ships had been destroyed by the raiding party and these were not to be replaced. Instead, the twelve vessels not provided with this equipment were to be armed with the marvelous new weapon developed in the Parsons laboratories. And, by agreement between the governments, Ray Parsons was appointed as commander-in-chief of the fleet. The intercepted messages of the enemy were read nightly to the listening millions and the plans for a decisive blow and the subjugation and colonization of the

earth by the blond giants from Callisto were laid bare even as they developed. The great spherical war ships were assembling at the lunar base for the coming engagement. Fifty of them, there were to be, and fifty more waiting in Callisto to follow up the war vessels with a migration of many thousands of the blond horde to the earth. It soon became evident that the Tellurian fleet would be ready in ample time to anticipate the date set for the great battle. With this certainty, the world resumed its normal activities and the work of reconstruction started in the several devastated cities.

Ray did not at first take kindly to his appointment, and finally accepted only under the condition that the "Meteor" was to be flagship of the fleet and that his radio orders should issue therefrom. His laboratory and workshops were beehives of activity and the G-ray generators, as the new apparatus was termed, were turned out in record time and shipped to the yards where the new vessels were nearing completion.

Mrs. Dowling took Lola into her home, though she fought a hard battle with herself before consenting to this move. But the girl was so sweet and so obviously fond of her son, that the motherly heart of the older woman could not resist the appeal of this child, whom her son loved. From Eddie there was no news for several weeks, and Lola berated herself incessantly as the cause of his disappearance. But Ray and Gary comforted her with the suggestion that he had, in his disappointment, enlisted amongst the volunteers called for to man the new war ships. Eventually, through a personal call injected into a news broadcast through the influence of Gary, they learned that this was the case. Much of the anxiety of those he had left behind was thus relieved, but due to strict governmental regulations, they were unable to learn the number of the ship to which he was assigned, nor were they permitted to communicate with him or he with them.

It was evident that the optical instruments of the Callistonians had not revealed to them the activities on earth in preparation for the coming war, for the messages gave no indication that resistance was expected. The enemy had already won the war in their own estimation.

The alterations to the "Meteor" were completed. Six new rocket tubes were added and the G-ray generator installed. Sufficient fuel and provisions were stowed away in her compartments to permit of a voyage of several weeks' duration. Her acceleration and deceleration compensators were modified to take care of the greatly increased speed. Then came the word that the entire fleet was in readiness and Ray was called to Washington for the final conference in which the plan of attack was to be agreed upon. There still remained eight days before the date set by the enemy for their expected offensive.

Three days later the twenty vessels from foreign shipyards had arrived in the United States and were assembled in various flying fields along the eastern seaboard. Ray returned to his laboratory for the "Meteor." Meanwhile one of his assistant engineers, Marshall Bostwick, had been instructed in the operation of the small vessel and had taken her up for a number of trials. She was pronounced perfect and Ray planned that her crew was to consist only of the new pilot, Gary, and himself. But he had reckoned without Lola.

The plan of attack was simplicity itself. At Gary's command, the thirty vessels were to take off from their several locations and were to gather *en masse* at twenty thousand feet altitude over the city of Philadelphia, which was about central with reference to the various flying fields. From this point the voyage to the other side of the moon was to commence, the "Meteor" leading with five of the new vessels, two of which were to have the G-ray armament. The remaining twenty-five were to follow in groups of five, each group including two of the ships with G-ray generators. Upon reaching their destination an immediate assault on the enemy was to be made and no cessation of hostilities was to be permitted until the entire enemy fleet and the lunar base was destroyed. The fleet was next to proceed to Callisto and engage the fifty space fliers that were reported as awaiting news of the success of the first fleet.

At the hour set for the departure the "Meteor" was ready in her own enclosure. At the controls sat Marshall Bostwick and, watch in hand, Ray faced the microphone through which his orders were to be issued. Gary was engaged in clamping the outer door of the air lock.

"Attention, squadron commanders," spoke Ray. "All ready?"

There followed the assenting replies from the commanders of the five squadrons and from the temporary commander of his own group. Then came the order to take off and, as the "Meteor" taxied across its field and roared over the tree tops, they knew that the other thirty vessels of the fleet were likewise taking to the air. The "Meteor" climbed rapidly to twenty thousand feet and headed southward.

With all their attention focussed on the instrument board and the controls, the three men were astonished beyond measure at the silvery tinkle of feminine laughter that assailed their ears. Ray swung about as if on a pivot.

"Lola!" he gasped.

"Yes, it is Lola." The girl had crept from her hiding place amongst the blankets in one of the bunks. "You did not think that this so grand war could be fought without Lola, did you?"

"Why—why," Ray stammered. Then he was forced to laugh in spite of himself. "But I guess it's all right," he concluded lamely.

"Most certainly it is all right, Ray. Lola must be with you when you free her own country. Is it not true?"

"Yes it is true, my dear," he admitted readily, "and I am very sorry that I did not see it in that light before. You are welcome aboard the 'Meteor.'"

"Lola is glad," she stated simply.

And Ray and Gary were glad too, but Marshall Bostwick was not so sure. He was a matter-of-fact sort of chap and the idea of having a woman mixed up in this mess did not appeal to him. But then, he had not known Lola previously.

They were soon at the appointed meeting place and within a very few minutes the entire fleet had assembled, the key squadron of five of the larger ships taking its place behind the "Meteor." Without further delay Ray's orders were forthcoming and the fleet headed skyward with gradual acceleration to the velocity required in escaping the gravity attraction of the earth.

One by one the vessels of the fleet reported that all portions of their apparatus were functioning perfectly and by this time a speed of two thousand miles a minute

had been reached. Ray drew a breath of relief and ordered all ships to maintain this rate of speed. They would arrive at their destination, the moon, in about two hours.

As the earth receded rapidly astern and the moon's disc evolved into a clearly defined globe of ever increasing size and brilliancy, Marshall Bostwick could not restrain his exclamations of surprise and wonder. Ray and Gary exchanged smiles over the thought of how many expressions of similar wonder must at this moment be vented on board the other thirty vessels, none of whose occupants had ever seen the marvels of the universe under such conditions. The moon rushed toward them with terrifying rapidity and the great flaming orb of the sun seemed stationary in the blackness of the firmament, its most brilliant prominences partly hidden behind the earth which was now presented as a crescent with fully three quarters of the visible surface in semi-darkness.

The trip was uneventful and of unbelievably short duration. As they approached the brilliant near side of the satellite, Ray issued his orders and the fleet swung about to encircle the body at about three thousand miles distance. The speed was reduced gradually until they were traveling at no more than a tenth of the previous rate. At the reduced speed they drew closer to the surface and in about twenty minutes had reached the point where a sharply defined shadow told of the merging of the daylight of the moon into its long night. They crossed into the darkness of the other side and were headed toward the huge sea at whose precipitous shore the Callistonian village was located and at which point they expected to find the enemy fleet.

The first engagement of the war was about to begin.

A Surprise Attack

WITH the sun no longer visible, the blackness of the heavens became still deeper and the stars shone with magnificent splendor. At the horizon the great gleaming crescent of the earth sank from view with majestic grandeur. Venus shone brilliantly in the sky and the reddish point of light that was Mars took on an importance and beauty it had never presented before. The darkness on the surface was not complete, for the combined light from the naked stars provided sufficient visibility, so that the great craters and their central spires could be made out dimly when the eyes of the observers became accustomed to the comparative obscurity. But it was necessary that the automatic heating apparatus of the vessels come into operation to keep their interiors at normal temperature in the moon's shadow.

When they had proceeded another quarter of the way around the satellite, Ray called for a halt and for a drop to within two or three miles of the surface. With this accomplished, he searched the dim-lit landscape below with powerful night glasses and soon made out the locality of the village and the fleet of the enemy. As they drew nearer, all observers were able to make out the shapes of the fifty Callistonian vessels, for numerous round windows in the vessels were illuminated by lights from within. The village too showed lights, so there was no difficulty in reaching close range for a surprise attack. Three of the squadrons were directed to spread out and encircle the area including the village and the open space where the huge enemy vessels reposed. These were to watch for surprise counter-attacks by the Callistonians and were to utilize fusing beam and G-ray generators where necessary, as well as the paralyzing energy, in cases where any of the enemy might venture forth in their air-tight suits. The "Meteor" and the other half of the fleet were to make the main attack, relying principally on the G-rays and the suddenness of their onslaught.

All lights on the Tellurian vessels had been extinguished and Ray gave orders that the searchlights were not to be used, unless it became absolutely necessary, when they were to be directed at the individual warships of the enemy to serve the double purpose of illuminating the hulls and of blinding the enemy observers. When the squadron commanders reported that fifteen Tellurian ships now encircled the foe, the order to attack was given.

"Marsh," said Ray to his pilot, "keep your eyes peeled now and your fingers on the rocket controls. I am going to handle the G-ray and Gary will use the fusing beam. All set now."

The last was spoken into the microphone and simultaneously with the words the "Meteor" swooped directly for the center of the huddled mass of spheres, followed in this maneuver by the fifteen vessels of their own fleet. Seven faintly visible purplish rays impinged upon seven of the great spheres and nine of the fusing beams searched for vulnerable spots in the hulls of the enemy ships.

"Holy Smoke!" shouted Gary, "Just look at that!"

He was watching the sphere at which Ray had directed his G-ray. It had flattened itself to a crushed mass of twisted metal and one of the nearby vessels crashed into the wreckage with such force as to split itself asunder and spew forth its machinery and occupants into the deep powder that carpeted the surface. To the left there shot forth from another of the spheres a blast of incandescent particles that resembled the discharge of a Bessemer converter. A fusing beam had contacted with the upper protuberance of this ship and the escaping air from the interior carried away the white hot metal in a shower of sparks that lighted the scene brilliantly. The attackers withdrew momentarily to observe the result of the first onslaught.

Fully ten of the huge spheres were crushed by their tremendous increase in weight caused by the action of the G-rays. Five more were flaming torches from successful operation of the fusing beams. But the remainder of the fleet had come to life and several of the vessels had already left their positions and were rising to the defense. From these there came the beams of searchlights that hunted the skies for the cause of the unexpected disaster. One of these beams lighted up the tapering hull of a Tellurian vessel and two of the yellow rays converged immediately to contact with the unwelcome visitor. Ray and Gary watched spellbound as this ship of their own fleet hovered helplessly for a moment and then plunged to the ground, entirely out of control.

Lola cried out, "Oh, what if Ed-dee is on that ship? He will be killed and it is all Lola's fault."

But she soon forgot her fear and became absorbed in the scene of action that quickly developed. The outer ring of Tellurian vessels had brought their searchlights into play and an arena of great brilliance was outlined beneath them. There was confusion in the village and

confusion in the maneuvers of the spherical ships in the plain. Two of the caterpillar tractors lumbered forth from the village, their yellow rays searching the skies for the ships of the invaders. Numbers of ballooned helmeted figures could be seen rushing from the doors of the cylindrical buildings. Three of the gigantic spheres which had risen some distance from the surface came crashing down, welded into a solid mass of distorted metal by the terrific mutual attraction set up by one of the G-rays.

Another of the Tellurian vessels was down and the "Meteor" rose rapidly to attack a number of the spheres which had reached an advantageous position. The key squadron followed and they made short work of the Callistonians who had ventured aloft, the simultaneous action of three of the G-rays hurling five of the gigantic spheres into a death huddle that provided a vivid pyrotechnic display and a crash below, that half buried the wrecked machines in the lunar dust. Beneath them the scene was indescribable. Even the cylindrical habitations of the Callistonians had flattened into unrecognizable masses of metal under the influence of the G-rays. Not a living being was in sight, all having been either killed in the wreckage of their habitations or stretched lifeless in the dust by the action of the paralyzing energy of the Tellurians. As the "Meteor" approached the scene, one of the big spheres rose to meet the tiny vessel and the yellow ray spurted forth so suddenly that Lola screamed in alarm. But the Callistonian was too late, for already the G-ray had found its mark and the sphere rolled over on its side, thus sending the yellow ray wide of its mark. It poised for a second or two in this position and then, with inconceivable acceleration, hurtled to its destruction against the edge of the precipice.

The encircling squadrons of Ray's fleet had converged on the remaining scattered spheres and a dozen individual encounters were in progress. At one point Ray saw that three of the spheres had attacked a lone Tellurian vessel and he hurled his squadron to the assistance of the besieged ship. This was the most serious single encounter of the battle and two of Ray's squadron of five ships went crashing to destruction, one of these being caught between two of the spheres when they crashed together under the influence of the G-rays. But, with this engagement ended, there remained but six of the big spheres and these made a frantic effort to escape. At Ray's quick command, three squadrons of his fighting ships darted skyward with bright streams of burning gases from their rocket tubes marking their trail. The rest of his fleet landed amongst the ruins of the Callistonian vessels where five of the graceful ships from Earth also lay helpless in the thick dust.

Then came a triumphant report from the blackness of the heavens and Ray doffed the headphones of the radio with satisfaction.

"All six of the escaping vessels have been destroyed," he stated. "The commander of the A-7 advises that they crashed at a point some fifty miles from us. Now we'll see if any of our comrades are still alive in the ships that were brought down."

Lola was weeping as he pulled on his air-tight suit and she begged for permission to accompany them on the search. Her own trappings were still aboard the "Meteor" and Ray had not the heart to refuse her request. So, when all three were fully clothed in the flexible suits and with the bulky helmets locked in place, he and Gary and the Callistonian maiden stepped from the outer door and into the scene of carnage.

Meanwhile the remainder of the fleet had landed and Ray was overjoyed to see that one of the vessels he had thought destroyed was rising from its position, apparently unharmed. The effects of the yellow ray had worn off and the commander, discovering that his apparatus was once more in order, was experimenting with a view of determining whether the ship could be navigated. But four Earth vessels lay where they had fallen and Ray's party immediately set forth to investigate their condition.

The victory had been a glorious one but Ray hated to lose even a single vessel. And Lola was hurrying with all possible speed to learn whether any of the four disabled ships were from America.

By Radio With A-4

SEVERAL hours were spent in searching the wreckage of the Earth vessels, all four of which were so seriously damaged that portions of the hulls had been torn open, thus allowing the oxygen to escape from within and causing the suffocation of the crews. The bodies were all recovered and a decent burial was accorded their comrades by numbers of enlisted men from the other vessels who had joined the searching party from the "Meteor." One of the destroyed vessels was the A-3, an American-made and American-manned ship, and when the bodies were taken from this one Lola examined each one carefully through the thick window of her oxygen helmet. But she was unable to recognize the features of Eddie Dowling among those horribly swelled and bloated corpses.

The Callistonian vessels were twisted and torn and smashed beyond belief. Those which had been brought down by the G-ray were literally smashed into the ground and had burst open from the impact which had crushed them flat. Those with openings burned through the hulls were not otherwise badly damaged, excepting in those cases where they had dropped from a considerable height, but it was clearly impossible that any living creatures remained within them on account of the loss of oxygen through the great holes created by the fusing beams. The village itself was a wreck and the numbers of those Callistonians who had ventured forth in their oxygen helmets and airtight clothing were still helpless from the effects of the paralyzing rays of the Tellurians. These were about forty in number and were carried to the various vessels of the Tellurian fleet where they were restored to consciousness after being securely bound. Ray had no intention of countenancing wanton slaughter of these helpless beings.

When the Tellurians had returned to their ships and all was in readiness for the take-off, Ray tuned his radio transmitter to the frequency of the International Communications headquarters and was soon conversing with the operator on duty. He reported the results of the lunar battle and was extremely surprised at learning that the news broadcasts had already announced most of the story to the world.

"How in Sam Hill did you know?" asked Ray.

The operator laughed. "Why there were miles of tape rolling out of the recorder here, Mr. Parsons," he said. "The enemy kept their radio going until the last minute—until the village itself was destroyed—and our

translations gave us a very good word picture of the whole thing right in the midst of the action. But a bad feature of it is that their home folks know all about it too, and will be prepared for you when you get there."

"Yes, that is true. They may even come out to meet us. But we have no alternative—we must proceed at once to Callisto and you can notify the news syndicate to that effect."

"Very well, Sir."

And, with a quick turn of the tuning dial, Ray was once more transmitting on the frequency to which all receivers of his fleet were tuned. The order to take off was given at once.

Within a very few minutes they were once more out of the moon's shadow and were headed for their destination on a carefully calculated path which was to measure close to 450 millions of miles. Steadily the speed was increased until they reached the unbelievable velocity of eighty thousand miles a minute. Earth and its tiny satellite were soon left far behind.

When they had settled down to a steady grind at this speed, Lola approached Ray timidly. "Will you not attempt to communicate with Ed-dee for Lola?" she asked.

"Why you poor kid," laughed Ray. "Of course I will. I should have thought of it long ago. As commander of the fleet I will now be able to get in touch with him."

No sooner were the words uttered than he turned once more to the microphone and requested the commander of the American vessel on which Eddie Dowling was carried as a member of the crew to report in. Lola stood expectantly at his side and soon there came the reply. For the first time Ray knew that Eddie was on the A-4.

"Get him on the radio, Thomas," he requested of the A-4's chief officer. And Lola clapped her little hands with joy as Ray awaited the voice of his erstwhile mechanic.

"Hello Chief," came the voice, "some fight back there on the moon, wasn't it?"

"Yes, but that's not the reason I called you. There is a little lady on board the 'Meteor' who would like to speak with you."

"For the luva Pete, Chief, is Lola along with you?"

"She is, although I didn't know it until we were well on our way. She came as a stowaway. But here—I know you must be anxious to speak with her."

"No, no, now—wait a minute. I've been doing some thinking since I packed up and joined this outfit. I've been bughouse for even thinking about her. Why, doggone it, she's a princess in her own land, and after we get things straightened out up there, what chance do I stand with her? No Chief, she's not for me. I won't talk to her."

"But Eddie, you don't understand. She had a fit when she found you were gone and has been upset ever since. She wants you, man. Don't be a fool now—come on and talk to her."

He turned the headphones over to Lola and she spoke rapidly into the microphone, begging for forgiveness and understanding. Ray winked solemnly at Gary, but Marsh Bostwick listened in disgust.

Lola waited patiently for a reply but there was none. Eddie had left the radio of the A-4. Once more the girl spoke and Ray frowned in annoyance as he realized that Eddie was actually refusing to converse with her. There was silence for a moment and then Lola removed the phones and, without looking at the men, rushed to her bunk where she buried her head in the pillow.

"Why darn his hide!" commented Ray, under his breath. "What shall I do, Gary? Shall I have his captain command him to speak to her?"

"No, I wouldn't. He's just that stubborn he would be likely to refuse and would then be disciplined for insubordination. Let the thing straighten itself out——"

"I guess you're right. But Eddie is a fool just the same. A lot Lola will care whether she is a princess and he an ordinary mechanic. She proved herself when she came back from Washington."

"You've changed your mind about her I see," laughed Gary.

"Yes I have. She's a brick and I hate to see her unhappy."

They both cast affectionate glances in the direction of the girl's pathetic little figure, and somehow their eyes misted when they observed that it was shaken with soundless sobs.

Marsh Bostwick kept his fingers on the rocket control buttons and offered no comments.

IN less than four days by Earth time the fleet swung into the orbit of Jupiter and approached the huge planet at a distance of three million miles, decelerating gradually until a second change in direction was ordered to make the approach to Callisto. When the orb of the satellite loomed large in the field of the telescope of the "Meteor" it was seen that a great portion of the surface presented to view was covered with a dense layer of clouds. The reflected light was far from intense on account of the great distance from the sun, whose flaming orb had now become of small size and importance in the blackness of the firmament. Lola, more sedate and solemn of mien than she had been since Ray and Gary first met her, clutched nervously at her throat when they drew near to the body that was her loved home. She had not spoken of Eddie since the attempt to communicate with him, but her two friends knew from her demeanor that she was suffering intensely, and as a consequence, they had made every effort to keep her entertained during the long voyage.

Their instruments soon registered the sensible gravity field of the satellite and it was not long until they approached so closely that the globe filled their entire field of vision. Still the dense cloud layer persisted and Ray had some doubts as to the advisability of diving through the rolling banks of billowy whiteness. The barometer showed a slight pressure of atmosphere outside the vessel and the speed of the fleet was reduced to less than a thousand miles an hour. They were in the atmosphere of Callisto.

Then came the Callistonian fleet, apparently the entire fifty vessels, and it rose through the clouds at a distance of not more than five miles from the Tellurian fleet. Evidently the enemy had learned of their approach by means of sound detectors or some similar means. The third great battle of the war was about to start.

"Vilyon, of the Anurdi"

THE spherical vessels, when they sighted the fleet from Earth, drew together in close formation and hovered expectantly. Ray did not know what to expect, for he knew they had been forewarned by the

lunar radio, and would probably have formulated some definite method of attack. He therefore ordered his own fleet to spread out in open formation, each squadron keeping at a distance of at least one half mile from its nearest neighboring squadron. He then proceeded slowly in the direction of the motionless enemy fleet to get within range for the use of the G-ray.

They had not long to wait for action on the part of the enemy. When the "Meteor" was still more than a mile distant, there came a sudden barrage of the yellow rays—three from each spherical ship—and these were concentrated on his own squadron. Helplessly Marsh Bostwick pressed the rocket control buttons; unsuccessfully he attempted to start the motor in the forward compartment. The atmospheric density was now sufficient for the use of wings and propellers, but the ignition system failed to function due to the influence of the deadly yellow ray. And their vision was completely obscured by the intense darkness that fell about them like a pall. Ray shouted frantic orders into the microphone of the radio, which had likewise gone dead. The "Meteor" and its accompanying squadron drifted toward the satellite with ever increasing speed. Then, just as the "Meteor" went into a tail spin from which all efforts of the pilot failed to recover, the impenetrable darkness melted into the brightness of an equally impenetrable mist and Ray knew that the effects of the yellow rays had worn off. Simultaneously with the passing of the darkness there came the startling roar of the motor and in a few seconds Marsh had pulled out of the spin and was heading the vessel into a steep climb. Then they were once more about the clouds in the pale light of the sun. Two miles ahead and several thousand feet above them was the Callistonian fleet, all of their yellow rays directed into a falling cloud of blackness that told of another of Ray's squadrons sent toward the surface. But two other squadrons had flanked the enemy fleet and he saw that they were close enough to use their G-rays and fusing beams. Then the remaining three vessels of his own squadron rose from the mists and joined the "Meteor," which led them rapidly toward the unsuspecting enemy fleet. The Callistonians had at first made the error of attacking at too great an elevation, thus permitting their intended victims to recover from the effects of the yellow rays before crashing on the surface of the satellite. Yet two of Ray's squadrons were down.

With no less than six of the powerful G-rays directed into the mass of the spherical vessels there were almost immediate results. Suddenly the mass huddled still closer and then, with a crash that came like a terrific explosion, the entire fleet had merged into a solid agglomeration of twisted and crushed metals. Bodies of the blond giants were thrown from the ships as they burst under the impact, bodies that went hurtling toward the great cloud banks and were swallowed up by the mists in their swift descent. Then, with a reeling lurch, the huge mass of crushed ships plunged downward so rapidly as to be swallowed by the same mists before the Tellurians fully realized what had occurred. Lola's hands were clenched so tightly together that her knuckles showed white between fingers that pressed deeply into the flesh. But her face shone with gladness, for she knew that her own people were to be forever freed from the oppression of the blond giants.

Ray issued orders with rapidity as the radiophone was restored to normal functioning, and the remnants of the fleet drew into formation and prepared for the dive through the clouds. He checked up at once and learned that six of his ships did not respond to his calls and among these six was the A-4. His heart sank when he discovered this but he did not tell Lola. Then they were in the clouds and he watched the periscope intently as Marsh maneuvered the tiny vessel to lower altitudes. He was not entirely certain of the accuracy of his altimeter on account of the peculiar gravity field of the satellite, which seemed to increase very rapidly in its effect, as they drew near its surface.

After what seemed like an endless glide, the "Meteor" emerged from beneath the clouds. It was fortunate they had proceeded so cautiously for the "ceiling" was no more than fifteen hundred feet above the surface. The fleet was directly over a city of considerable size, which city was surrounded by a broad wall of glistening metal. And a huge corner of this city lay a pulverized mass of ruins where the pile of Callistonian vessels had landed and half buried itself in the surface, carrying buildings, wall and living beings with it.

"Viljon!" exclaimed Lola, "the capital city of the Anurdi, the enemies of my own people. This is their great stronghold and much care must now be taken."

But the city was a bedlam of excitement and the inhabitants could be observed milling around in the narrow streets, apparently in a frenzy of fear. The buildings were not of the cylindrical type which had been erected by the Anurdi on the moon, but they seemed to be of the same kind of metal. It was a city of not more than five stories in height, with all buildings of monotonous similarity in size and shape. Each building filled a complete block between the narrow thoroughfares, which were laid out in absolute parallelism. At a number of points along the remaining sections of the wall there were towers, and Ray suspected that these were provided with penetrators of the yellow ray and possibly with the attracting force of the Anurdi as well. He therefore directed his vessels to concentrate the combined energy of their G-rays and fusing beams on these points. The results were immediate and complete, for each tower crumpled into a mass of crushed and semi-molten metal under the onslaught. The frenzy of the inhabitants increased to the proportions of an uncontrollable uprising. Then, in an open space in the center of the city, a mob of citizens could be seen unfurling a large banner of snowy whiteness. The Anurdi were suing for peace!

Ordering the remainder of his fleet to hover over the city, Ray directed his own pilot to land the "Meteor" in the open square where the white flag was displayed. As they descended it was observed that many small aircraft were on top of the flat-roofed buildings but that none were in the air. It was evident that the Anurdi were thoroughly cowed by the Tellurian armada. And indeed this was no wonder, for the flower of their young manhood had been wiped out of existence with the annihilation of their fleet by the Tellurians.

Lola was recognized by Ja-tal, ruler of the Anurdi, a giant among giants. He it was who greeted the little party from the "Meteor" when it landed and, scorning a bodyguard, made overtures for peace with Lola as interpreter. The treaty of Viljon, later signed, was based on these preliminary negotiations and its provisions are now so well known as to make it unnecessary to go into them in any detail. Of prime importance to Lola was the agreement that all Anurdi forces withdraw from Dassan, her own native land. But to the Tellurians the

assurance of lasting peace between Tora and Thares came as a complete triumph, and the garrisons of Earth, that later became permanent landmarks throughout Anurdi, did not lack for volunteers from all nations.

With the preliminary negotiations completed and the city of Viljon changed from a chaos of fear to a scene of jubilant celebration, the "Meteor" once more took to the air, and headed the search for the vessels which had been brought down by the yellow rays of the Anurdi. All of these were found outside the city walls and the first three that were located were seen to be complete wrecks with all occupants either killed or dying. Then they came to the A-4 and Lola's hands again fluttered to her throat, as they observed that the ship was scarcely damaged and that a number of its crew were busily engaged about the landing gear, endeavoring to restore the partly overturned vessel to an even keel. The other two ships of the Earth fleet were close by, and these too seemed to be but slightly damaged and with full crews clustered about them. The Tellurians had lost but three of their vessels.

Overjoyed, Lola was first to step from the "Meteor" when it landed beside the A-4 and she rushed to where Eddie, in grimy overalls and with a huge wrench in his hands, was at work on one of the landing gear struts.

"Ed-dee," she addressed him timidly.

A broad black smear appeared on his forehead as he drew his hand across it in surprise. "Why, hello, Lola," he returned lamely.

Just then, with a roaring swoop, there landed a Callistonian airplane, a craft very similar to those in use on Earth. It was ship from Dassan, and when it landed a group of Lola's own people rushed to the A-4 and surrounded her before she could converse further with the much flustered mechanic. Protesting vainly, she was swept from Eddie's side. Then a handsome youth of Dassan, garbed in a magnificent purple costume of the skin-tight variety worn by all of his people, swept her into his arms and literally carried her into the newly-arrived plane. Eddie gazed after them with open-mouthed astonishment and with a sinking heart. Lola already had a lover, and of her own kind!

Eddie Returns to the "Meteor"

TWO of the Dassanese were left behind when their plane took off, one to accompany the "Meteor" and to direct its pilot in leading the main body of the Tellurian fleet to Sharan, the capital of Dassan, the other to remain with the three slightly damaged Tellurian ships and to direct them to the same location when repairs were completed. By arrangement with the commander of the A-4, Ray exchanged Marsh Bostwick for the disconsolate Eddie, whom he returned to the "Meteor" as its pilot.

"Hello Eddie," Gary greeted him, when they were about to board the 'Meteor,' "why so pensive?"

"Oh now, lay off the kidding," replied Dowling, "You know what is wrong with me. I'm a nut too for taking it this way, but I want no wise cracks about it."

"No offense, old man," said Gary, "And I want to tell you that you are all wrong about Lola too. Don't give up so easily."

"I know when I am licked, Gary. Didn't you see the guy who carried her into the plane? Swell chance I've got."

"That may not mean a thing. He may be a cousin or something. At any rate, Lola's actions during the trip showed us what she thinks of you. Stick to it, and I'll bet you get her, Eddie."

"Cousin, my eye. You never saw any cousins as affectionate as those two were. Anyhow, I don't want to talk about it any more."

So Gary desisted and Eddie took the pilot's seat as Ray entered the cabin with Thard, the Dassanese navigator. Thard was a well-set man of medium height and had a pleasant and friendly manner. Of course he could speak no word of English, so it had been arranged that he would direct the Tellurian fleet by means of plotting the course on a chart of Thares, with which he had been provided. The Dassanese plane had taken off and had long since vanished in the distance, when Ray issued orders for the fleet to take to the air.

It was with keen interest that the occupants of the "Meteor" examined the chart which Thard spread before them. From it they saw that Callisto was mostly covered by water and that, with the exception of a few small islands, there were but two continents. These were Dassan and Anurdi, and Thard pointed out that Viljon, which they were just leaving, was close to the seacoast.

So it was that they soon headed over the great sea of Pasara, as it was designated by Thard, with the fleet stringing along behind its tiny flagship. The journey was one of about three thousand miles, as nearly as Ray could estimate from the supposed diameter of Callisto, so he set the speed at five hundred miles an hour in order to reach their destination in six hours.

The ocean, strangely, showed a muddy red-brown, instead of the deep greenish-blue of the oceans on earth. Of course the weather was extremely cloudy and that had some effect on the apparent color of the water, but he and Gary decided that it was mainly due to a high concentration of certain minerals in solution or in suspension, possibly iron oxides. The surface was troubled and choppy, though there was very little wind, but Thard did not seem to be concerned about the weather so the Tellurians presumed that conditions were more or less normal for the world they were visiting.

Ray made some tests of the outside atmosphere and found that it was of nearly the same density and composition as that of the earth. However he found certain peculiarities in the gravity of Callisto which could only be accounted for on the assumption that there was a gravity force separate and distinct from that due to the mass of the body alone. The altimeter depended on normal earth gravity and, while the surface gravity of Thares appeared to be about the same as that of Tora, its indications became widely erroneous when at any considerable altitude. The force did not vary inversely as the square of the distance from the body, but at a much higher rate, thus confirming Ray's previous supposition, that there was a supplementary force which accounted for the high surface gravity of so small a body and its retention of so considerable an atmosphere. This they learned later was due to an extremely high percentage of magnetic ores in the interior of the body; the peculiar properties of whose magnetic fields were quite similar to the artificial gravity set up by the G-rays.

When they approached the shores of Dassan the skies were clearing, and soon the sun shone forth weakly, as if it were some infinitely remote body, that seemed scarcely akin to the sun that shone on Earth. But the temperature of the air was nearly eighty degrees, and the two scientists from Tora were forced to the conclusion that

it was warmed by the internal heat of the satellite. They later learned that the assumption was nearly correct, although the warm climate of Thares was actually brought about by the presence of huge deposits of radioactive minerals near the surface, rather than by the high temperature of a molten interior. The waters brightened somewhat with the coming of the noon-day sun, though they still retained the red-brown color to a great degree. The sun itself was almost at the zenith, thus indicating that about half of the long Callistonian day had passed —half of a day which, in earth time, was the equivalent of more than sixteen and a half days. Darkness would not come for a long time.

Thard was busy with the charts but he looked up with a pleased smile at the delighted exclamations that came from the visitors at their first view of the land of Dassan. The "Meteor" was speeding inland and the landscape below was of infinite variety and great beauty. They were over a rolling countryside which gave every evidence of the bounties of nature and the handiwork of a highly intelligent and industrious people. Uncultivated portions were lush with brilliant vegetation—hues and tints there were that would have delighted an artist. Farm lands showed great fields of perfect symmetry and with fully developed crops of strange grains and vegetables; strange for their color as viewed from the air. Purples and browns were the predominating hues and the Earth visitors had no means of knowing whether these were the colors of ripe or unripe crops. But it was a beautiful and interesting country and the occasional towns and villages over which they passed proved equally interesting and inviting.

Now they were over a city of considerable size and it was seen that much more of artistic ability had been expended in its planning than was the case in Viljon. These people did not adhere to the mathematical precision of their enemies in laying out the streets. Here there were many beautiful parks, circular in shape and with broad radiating streets that curved and wound in all directions through attractive residence districts where no two dwellings were of the same size or architectural design. Then they were once more in the open country, and the cloud of small aircraft that had surrounded them when they passed over the city, drifted away and the individual planes returned to their normal activities. The welcome accorded the fleet by such craft was a feature of the journey inland that marked the approach to each city of any size near which they passed, and it was extremely gratifying to the Tellurians.

When eventually they reached Sharan they found it the largest and most beautiful city of all, and its streets were bright with gay banners and buntings. They were welcomed in the air by six planes that flew in formation with the dignity of an official flight. By their maneuvers the six planes indicated that the Tellurian fleet was to follow in their wake, and when this was done, they soon reached a great amphitheater where thousands of the Dassanese had assembled, and where a huge landing space had been roped off in the center of the field. Lightly the "Meteor" dropped to a landing, the larger vessels following closely behind.

Upon the debouchment of the Earth visitors from their ships, a great hubbub of cheering came up from the assembled multitude and a group of gaily adorned Dassanse approached the four men who stood at the door of the "Meteor." Among these was Lola and she was at the side of the handsome youth who had greeted her so enthusiastically outside of Viljon. In fact they were holding hands when they drew near the "Meteor's" party and their faces were alight with happiness.

"See?" whispered Eddie, "What did I tell you? Fat chance there is for the little fat mechanic!"

"Oh, hush up!" hissed Ray, for the group was now very close by.

A Happy Ending

At each Tellurian vessel its crew stood at attention, the men dazzled by the magnificence of the amphitheater and confused by the shouting of the crowds. Lola's party, with Ray at the girl's side and Gary and Eddie bringing up the rear, visited every vessel of the fleet, and at her request, the crews were ordered to proceed to the great dais, which was seen in the field that faced the crowded tiers of seats. When the Tellurians had assembled and marched toward the dais in splendid military form, the demonstrations of the crowd came to a climax of tremendous enthusiasm. And when the three Earthmen from the "Meteor" were seen to accompany her to the seats of honor on the platform, the entire assemblage rose to stand in grateful recognition. With her guests all seated close by, Lola mounted the steps of a secondary platform on which were two gorgeously upholstered seats over which appeared a fan-shaped, jeweled emblem that was evidently the insignia of royalty in this strange land. She was not alone, for the handsome youth in purple followed her and faced with her a battery of what were obviously the microphones of a public address system.

The huge assemblage became still as Lola raised her hand and started speaking in her own tongue. She was radiantly flushed and was once more attired in a silver costume such as she had worn when the Earth men first took her into the "Meteor" on the other side of the moon. So beautiful she seemed when she raised her sweet voice in addressing her people that Eddie whispered an "ah" of admiration. But this changed to a muffled growl of annoyance when he saw that the handsome youth at her side had once more captured her hand and now held it tightly as if in the assurance of possession.

Lola's speech was of considerable length and was delivered with great vigor. The Dassanese listened to her in deferential silence for the space of many minutes. Then she turned in Ray's direction and addressed him in his own tongue.

"If it please you, my dear Ray," she said, "kindly step to the platform at my side."

Somewhat flustered at the request, he acceded, and the ensuing roar from the multitude served only to increase his embarrassment. Then Lola raised her hand once more and the crowd became silent as she renewed her speech. From the few words he was able to catch and from her continued repetition of his name he knew she was telling of his part in the salvation of Dassan.

At the conclusion of this address and the renewal of the cheering, Ray bowed and returned to his own seat.

"Glad that's over," he whispered to his companions, wiping great beads of perspiration from his brow.

Then a group of three men of Dassan mounted the small platform and faced Lola and her male companion. These were older men and were attired in long robes of red that trailed the platform as they walked. The one in advance of the other two carried a golden scepter in his

hand and with this he touched Lola's forehead, the while he read in a steady monotone from a small volume he held in his other hand. A deathly silence reigned throughout the amphitheater and Eddie drew in his breath quickly as the significance of this ceremony became evident to him. Priests, these robed Dassanese were, and they were performing a marriage ceremony! Lola was forever lost to him!

The rite was simple but impressive and Gary and Ray assiduously refrained from ooking in Eddie's direction, knowing that his feelings would be pictured tragically on the chubby countenance. Now the priest had touched the forehead of the handsome youth with scepter—his voice still droned monotonously as he read from the ritual. Then it was over. The youth kissed Lola on the forehead and bedlam once more broke loose in the stands. Many of the nobles of Dassan crowded to the couple on the small platform, evidently to express their congratulations.

Not until then did Ray steal a glance at Eddie, and he was genuinely concerned at the sickly pallor that had spread over his friend's features.

"Eddie old man," he admonished him, "don't you care. It's tough luck I know, but don't let it get your goat."

Then a surprising thing happened for Lola struggled from the midst of the group on the platform and rushed to where the crew of the "Meteor" sat. The nobles still remained with the handsome youth she had left behind and showered him with adulation.

"Ray; Gair-ree; Ed-dee," panted the excited Lola, "Listen to Lola while she explains what has transpired. I told my people of the so great bravery of you three in rescuing Lola from the persecution of La-dar on the satellite of Tora. I told them of the kindness of your people to Lola when she was on Tora. I told them of all that has happened since, and of Ray's leadership of the so successful expedition to Thares. My people are now free—the Anurdi have surrendered their weapons and their positions of authority and are leaving Dassan. All is to be happiness once more. And to Lola comes the greatest happiness of all."

Eddie hung on her words, his heart in his eyes.

"Yes," she continued, "for Lola there is the greatest joy of all. Lola's people begged her to take the throne of her parents, since to her it belongs by right of succession. But Lola refused and only now has the scepter been transferred to Lola's younger brother. Only now is that brother, Boruth, accepting the felicitations of the members of his court. Lola is free to choose her mate."

"Ye gods!" gasped Eddie, "Her brother! Well—I'll be horn-swoggled!"

Lola was advancing directly to the suddenly flushed and smiling mechanic. She held out her arms and Ray and Gary turned quickly away, their eyes once more misty.

* * *

FIVE years have passed since the war with Callisto and times have greatly changed. The devasted areas in the great cities of Earth have been completely rebuilt and are in every respect much improved by the rehabilitation. The scars left by the raid of the Anurdi have mostly healed.

Larger replicas of the vessels designed by Ray Parsons have made possible the establishment of regular traffic between Callisto and the earth. Great liners now make the journey in less than three days and much benefit has accrued to the inhabitants of both bodies. The Anurdi have accepted their lot stoically, and some say, have actually welcomed the change. Tellurians who man the many forts that were erected throughout Anurdi report that no troubles of any kind have been experienced and that conditions in all parts of the country are excellent. In Dassan there have settled many adventurers from all parts of the earth and these are in the habit of visiting their former homes occasionally and boasting of the many advantages of living on Thares. Conversely, there are hundred of Dassanese now on Earth and these are equally enthusiastic over their change in residence. Many people, like certain flowers, seem to thrive best when transplanted.

The radio used by the Anurdi in communicating with their lunar base was destroyed, so Gary Walton has perfected a most powerful apparatus of his own and is now installing a station in Sharan, by means of which it is hoped that reliable communication with Earth may be effected.

Ray Parsons is even more deeply immersed in his scientific work than before. After refusing all rewards offered him by the nations of the world, he set about exploring distant bodies of the solar system. Finding Mars and Venus hostile and undesirable fields for investigation, he determined to search further. Jupiter and Saturn were both visited and found uninhabitable, but he discovered a highly developed form of life inhabiting Titan, one of Saturn's moons. He spent more than a year on this satellite and returned with much valuable knowledge. His next venture will include visits to Uranus and Neptune. What may come of this great jump into space can but be conjectured.

Eddie still works in the Parsons laboratories, but has been promoted to the position of chief assistant and has complete charge in the absence of Ray. Eddie has lost much of his rotundity but is still the smiling-faced chap of the old days. And, not many miles from the laboratory, there is the modest dwelling that is home to him now—the happiest home in the universe, Lola claims.

THE END

Skylark Three

By Edward E. Smith, Ph. D.

Swifter, more thrilling and better than "The Skylark of Space," which was the most heralded and asked after novel of scientific fiction published in AMAZING STORIES or AMAZING STORIES QUARTERLY to date. Definite announcement of its publication date will be made in the April issue. A subscription now would ensure copies for you. The demand, those issues in which "Skylark Three" appears, will in all probability exceed the supply.

ACCORDING to our best astronomers, the earth is undergoing definite changes. Those changes, fortunately for human generations in the distant future, are so slow in development that they can barely be discerned even by the astronomers who have dedicated themselves to the task of measuring the differences. But suppose that some scientist should accidentally fall on the happy secret of a machine to speed up these changes? Much, indeed, might happen. With this idea in mind, Robert A. Wait, an astronomer of note, works up a fascinating astronomical fantasy, dealing with the troubles of the earth from cosmic and interplanetary forces, and gives us, in a popular vein, a great deal of instructive material.

Lanterns of God

By Robert A. Wait

Author of "The Invisible Finite."

Illustrated by MOREY

"BUT Carl, I don't quite agree that you will benefit mankind any. Where would we gain? And anyway, frankly I don't believe you can do it!"

"All right. You don't need to believe it. I'll prove it to you. You come with me to my workshop and I'll *show* you. I'll fix it so that I can carry you around on the point of a needle without your being conscious of your sharp chair."

Carl Brown was an investigator and inventor in his spare time. During the day he helped to mend autos. He was an expert mechanic and electrical wizard. Georgia Hemway was more than casually interested in "her man" and to see him depart from his more sane inventions into this new path of black magic was not at all to her liking. She straightened his tie and smoothed his hair a bit. Perhaps very personal attention would sidetrack his feverish plans.

"Let me show you why I feel confident I'm on the brink of a marvelous discovery, Georgia.

"First we must refer to some physical laws. You remember enough of your physics to get my points.

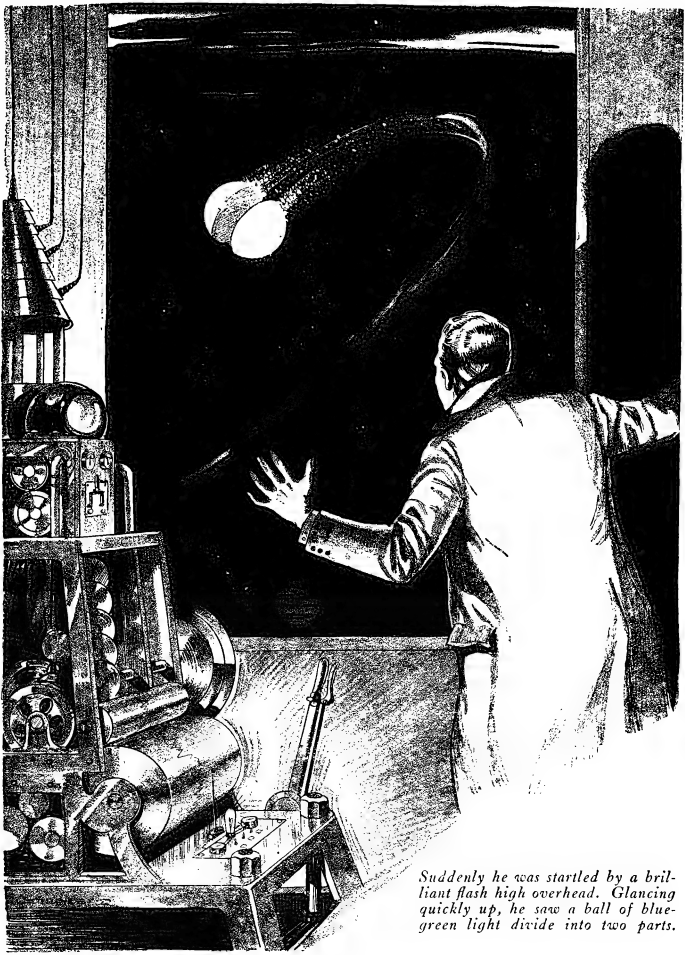
"The earth is a body which is subject to two types of dynamic forces. First, it is subject to the action of what I call 'gravitational friction.' Secondly. the earth and her atmosphere are not subject to any real friction from space in spinning around on the polar axis. Additionally, the earth is subject to a motion in an ellipse about our sun, held in its path by the combined gravitational influences of the solar system. One complete revolution through this ellipsoidal path we call a year.

"Now, of course, the earth is subject to an actual slowing up in her path by the combined effects of the planets about her. At times this old planet of ours wobbled in and out of her elliptic path very greatly. The path is only one-sixtieth out of circular, and figures tell us that the ellipse is slowly becoming more and more a true circle. It is said that in about 25,000 years the earth's path will be a circle about the sun, and that it will then proceed to swing to the other side of the ecliptic for some 80,000 years.

"What I wish to bring out is this: there are two types of dynamic forces involved—those known as conservative, and those known as non-conservative.

"The conservative forces are those represented by a pendulum motion where the total forces of energy remain conserved or constant. If the pendulum is moving rapidly, as at the low point or center of its swing, then kinetic energy, or energy of motion, is at a maximum, and potential energy, or 'reserved power,' is at a minimum. Now at the completion of the swing of the kinetic energy decreases rapidly to a zero and at the same time potential energy increases to a maximum. Then the pendulum starts back and the whole change is again gone through. These are the actions of the forces of gravity and elasticity. Of course, if there were no surrounding air or bearings to the pendulum to produce friction, the pendulum would *never stop* swinging. The last mentioned force—friction—is the non-conservative force. Through it actual energy is dissipated. The system becomes non-conservative, energy is constantly lost, and so eventually one of the forces, gravity or elasticity (which feed on energy for their operation) ceases to operate, the pendulum stops for want of kinetic energy."

"Yes, yes, but what has all this lecture to do with your wild scheme to annul gravity? I can see what you have proposed, but what has it to do with giving me a ride on a needle point?"



Suddenly he was startled by a brilliant flash high overhead. Glancing quickly up, he saw a ball of blue-green light divide into two parts.

The young woman spoke petulantly. She had hoped to avoid this; not that she disliked to talk of it, but she felt that Brown had done enough thinking for one day.

"Dear, you are more dense than I thought. Don't you see that the earth is subject to both gravity and elasticity? It has practically no friction among its neighbors, and so travels as a body subject to conservative forces, or practically so. Of course, on the earth's rotation on its own axis we have the actual braking effect of the ocean tides, due to the gravitational attraction of the moon on the mobile bodies of water. These do produce a dragging effect to slow our spinning action, but have little or no effect on our orbit about the sun. Now suppose I could control the form of energy to transfer kinetic to potential at will. What could I do to the motion of the earth about the sun? Well, what happens when I stop a pendulum in its swing? What happens to the kinetic energy? It becomes dissipated and the force of gravity predominates. Suppose I release the pendulum—what happens? It depends on where I stopped it. Should I have stopped it when kinetic energy was at a maximum, I would have so reduced the energy by that non-conservative force, friction (stopping it), that the residue of potential energy would not be great enough to overcome the force of gravity to answer to the call of elasticity. If, on the other hand, I stopped the pendulum at the end of the swing where kinetic energy is at a minimum, upon release the pendulum would describe about the same action as before, for friction can affect only kinetic energy, and thus the forces of gravity and elasticity would have sufficient energy to operate again. Thus we see that the less the kinetic energy is, the greater is the effect of gravity and the weaker the forces of elasticity.

"Let's reverse it and apply it to the earth. The orbit is the path of the pendulum and the earth is the weight on the pendulum. If the pendulum swings faster and faster, the weight becomes 'heavier and heavier,' or really as the kinetic energy increases (with speed) the effect of gravity becomes greater and greater. Applied to the earth, this means that if the earth should increase its kinetic energy, it would increase its orbital speed and lower the gravitational pull of the sun. If the kinetic energy is increased sufficiently, the gravitational pull can be overcome, or nearly so, since we could not convert all energy from potential to kinetic. When a body moves with an angular velocity, it has an acceleration to the center such as a pebble or other object swung in a circle at the end of a string. To cause this acceleration there is a force known as 'centripital force.' In accord with Newton's third law of motion that 'action and reaction are equal and opposite,' we must have centrifugal force or a force that causes the outer body to react in an outward force equal to the strain drawing it inward. As speed increases, our forces both increase. Since all bodies tend to move in straight lines unless compelled out of that line by some force, it follows that bodies moving in curves or circles are under stress of some force, and, according to Newton's third law of motion, there must be a force tending to change curved motion to straight line motion. It is this force which finally becomes great enough to cause the over-balance when centrifugal appears to overcome centripital and the strain breaks the string, allowing the pebble to fly off at a tangent from the circle it has been describing.

"Suppose, Georgia, that I could so increase the available kinetic energy of the earth's orbital motion as to quicken its speed? Could I not increase centripital and centrifugal forces acting on the sun and earth and finally so enlarge the force tending to straighten the earth's path of motion that we could break or at least *stretch* the gravitational bond between earth and sun?"

"But why? What would you gain if you did *stretch* the bond between earth and sun? What good would it do?" asked Georgia.

"What would you give to be able to see Mars at 5,000 miles distance? What couldn't we see there if I could so enlarge the earth's path about the sun as to come that close to Mars? I can control that enlargement. I can get earth that close to Mars and away again, back to this orbit or to one closer to the sun!"

"Carl, you're mad! Why we'd be killed the moment you started such a thing! You'd disrupt the whole solar system. All planets are dependent on others for their paths of motion. You would have us all colliding or being killed by the terrible earthquakes that would follow any change of gravitational pull by the sun."

"Tommyrot! I know I can do it and with no bad effects on the solar system or us. True, things will be different, but not so different that we can't live and survive it. Girl, think of the possibilities! Why, we can come close enough to Mars to send rockets to her. We can visit Venus, even Neptune, if we cared to!"

"You forget what Jupiter would do to our oceans and atmosphere. We'd have neither as soon as Jupiter's gravity was felt. Remember that of the four moons Jupiter possesses, three of them are bigger than earth's is! Jupiter has a volume 1,300 times that of earth and her gravity is such that a person weighing one hundred pounds here would weigh two hundred and sixty there. Now, Mr. Smarty, I don't believe you'd better go to Jupiter tonight!"

"Just the same I can do it. What's more, I *will* do it!"

"Carl Brown! If you even think of such a thing I'll never speak to you again, and that would be very hard for me to do. Oh my dear, please give up these studies in things of which you know so little. Work on those more practical things you have to solve. I want to marry you as you have asked a dozen times, but I will not, cannot marry a dreamer who lets the material part of life's rewards slip by him so easily as you have let them. Come, let's forget all this delirium you have been through tonight. Leave earth to go on as she has for the past billion or so years and build our home to enjoy the peace she offers all her children!"

"When will you marry me if I give up these ideas?"

"Carl, it depends on you. I will be happy to become your wife, just as soon as you can furnish the home we want."

The young inventor looked his skepticism. He half smiled and shrugged his shoulders.

"GEORGIA, it's now or never. If you promise now to marry me in June, I'll give up everything but my regular job and the 'practical' side of invention. Will you?"

"You know how hard it is to tell you no, yet you persist in your demands. No, I will not become engaged to you nor promise to marry you until you prove your willingness to give up these wild plans. You have promised me time and again that you'd get down to the grind —always you fail because of some new crazy scheme."

"Yes, and many are the promises you have made to me too, to become my fiancée. Always you refuse at the last minute, using my failings as an excuse.

"Listen, Georgia. I love you, and will always love you. But I will not be used nor treated as a child, and to hold my conduct over me as a stick is to treat me as a child. I am returning to my home and workshop now. I have there a machine just finished which I believe to be capable of putting this old world out into space so far that old Sol would never find it. I shall wait until ten tomorrow night, for you to call me or send word that you will become my bride in June. If you do not, I don't care what happens anyway and shall do my best—or worst—to so alter the operation of earth's laws of motion as to throw us out farther from the sun. Yes, to Jupiter or maybe Neptune—I'll give you your choice in that case! Good-night."

The door slammed and he was gone.

Georgia looked at the clock. Ten P.M. She glanced at the calendar. Monday, April 11th. Dropping into a chair she meditated. Would he? *Could* he? It was much like a hold-up. One doesn't believe the robber would shoot to kill, yet one isn't ever *sure*. One suspects the gun is empty of bullets, but one doesn't feel sure enough to risk his life by disobeying orders. What to do?

For a full hour the girl thought, murmured and frowned. Finally she arose and went up the dark stairs to her cosy room.

"Well," she mused half aloud, "if I don't marry him, he may try it. *It might work.* On the other hand, if I marry him, he might try it anyway—and it might work. Better to wait and see. Perhaps he won't try it. Maybe it won't work anyhow. If he's brute enough to try it against my wishes, I guess I'd be better off without him. But I do so love him for all his insane ways! I hope it doesn't work!"

With this thought she slipped in between the clean, cool sheets of her little green lacquered bed. Reaching over to her table, she picked up the latest copy of *Science Squibs*, which had in it many articles on astronomy, physics and related subjects. The girl was trying very hard to become acquainted with popular studies in astronomy and all science in general. For wasn't Carl interested in all these things?

For two hours she persued her reading, plowing laboriously through articles on celestial mechanics, electrical developments of interest, and discussions on the relations of electricity and gravity. Several times she found it necessary to stop and look up theories and laws in her handbook of science factors.

Especially was she interested in a short note on the appearance of several very bright stars in the heavens, which had flared brilliantly and then died away, leaving only traces of their paths in nebulous matter. Some discussion ensued in the article as to the probable speed with which the stars had come into and gone out of the visible universe, and the general relation of light, speed, and gravitational effects in celestial visitors, which left such veils of luminous cosmic dust or gas; scientists disagreed on the exact state of matter represented by these wisps of glowing star dust. There followed several articles on atomic disintegration, electrical power transformers, and technical mathematics.

Some way the pages of the magazine got to swaying about, and several of the lines jumped from the columns of print and danced crazily up and down until Georgia, startled from her doze, captured them with a sweep of her eyes—funny—how stars associated with x, y and z, and all seemed to float through those glittering electrical machines the magazine had said were—the comets—that made—the masses—of—nebulous—matter—.

The magazine slid to the floor; the arm which had held it fell limp and quiet and the girl sighed slightly. Cascades of dream waters foamed and splashed as they carried her in the canoe of fancy to slumberland.

"HARDING! Come here quick! Get that binocular there and look up at the zenith."

"Very well," Harding replied as he hurried into the observatory. "What's all the disturbance?"

The two men, both observers in the great Click Observatory, were doing a stretch of early morning observation. Jonesly had called his colleague in great excitement.

"A moment ago I was startled by a blue-white flare at the zenith and a second later the flare divided into two parts and receded one from the other in a flash, each describing a curved path. Fortunately I have an exposed plate in that camera. It will all be recorded on it. Look, now, for the two points of blue-white light are visible yet. They are still moving rapidly but are very plain."

The two men were intent for some time on the motion of these two points of light. Each point was moving in a curved path, and each was slowly straightening out more and more into a nearly straight path, traveling at right angles to each other.

"Well, we've seen all we can. I'm sure there won't be any further exhibition. Come, let's develop that plate. I've taken sufficient data for us to calculate the path and general size. We'll wire for data from the South American observatory and try to determine its distance." Plainly Jonesly was excited.

After sending the request by radio and developing the exposed plate, the two went to sleep for a few hours.

Breakfast found the men mixing grapefruit with cosmic sections, until the amateur would have feared to eat for fear of getting an ellipse mixed with a slice of buttered toast.

"Jim, there's only one conclusion."

Harding was consuming much jam and toast as he spoke to his fellow-worker.

"The photo developed from the plate we exposed shows conclusively that the visiting celestial body was traveling in a hyperbolic curve. Now of course that means that it will never return to the solar system—at least not unless it passes through infinity, which is difficult to conceive."

"Would you explain to poor, dumb me, please?"

Janet Jonesly was admittedly a butterfly and did not pretend to know anything about her father's calling.

"Certainly, Janet. You see in curves there are really but two kinds if we consider them from a very strict standpoint. They are the ellipse and the hyperbola. You know what an ellipse is—a so-called oval-shaped curve, but unlike a true oval it is symmetrical at both ends. The ellipse may be taken as including the circle. A hyperbola is a curve which approaches from infinity at the upper right to a point at the center of our drawing, curves around through the point chosen as the center or zero point much as the sharp curve of an ellipse and departs toward infinity in the lower right hand direction.

Now the characteristic of this curve is that its two ends never meet, constantly becoming farther apart until infinity is reached. On passing through infinity the curve again approaches the zero point from the upper left corner of our diagram and describes the same type of path as the first formed curve, departing to infinity toward the lower left direction. The two pieces of the curve are as mirror images to each other.

"Now, should a body such as a comet enter the solar system on a hyperbolic curve and depart on the same, it will never return to this system until it has gone through infinity. It will then return on the side opposite to its original visit. That is, unless you adopt Einstein's view that our cosmos is spherical and that light leaving us now may return after traveling completely around the cosmos. Einstein estimates this cosmos at 150,000,000 light years across. In that case, infinity becomes more understandable. At any rate, a body which travels on an hyperbolic curve will not return in a sufficiently short time to enable any records of its first visit to endure throughout the interval. Probably the earth would have become dead, and our sun cold and dark before the return of any such visitors."

"I see," said Janet, "but you fail to make me see where there are but two types of curves. What about a parabola? A circle? You fail to mention a straight line also."

"Daughter," began Jonesly, relieving his friend of the task of educating his pretty daughter, "a parabola may be considered as a partition between an hyperbola and an ellipse. A circle is merely a special case of the ellipse where the eccentricity is zero. Although the so-called straight line is not, strictly speaking, a conic section, it may surprise you to learn that a straight line is really an arc of a circle!"

"How idiotic it sounds. Dad, if you were given to joking, I would believe you were stringing me with that remark. I suppose I'm too much of a geometric imbecile to understand how that could be."

"No, daughter, even you can understand!"

The girl's father smiled as he made this remark which she knew he meant only as a jest. He was never seriously sarcastic.

"First of all, let's start with a three-inch circle. Its curvature is apparent—very much of a curved arc. Now notice that as the radius of the circle increases, the curve in the arc becomes less and less. Suppose we increase the radius of the circle to one hundred feet. Now take a one foot arc out of this circle and you will find that the curvature of this arc is very slight compared to the curve of a smaller circle. Suppose we increase the radius of the circle—what happens to the curvature of the arc?"

"Why, the curvature becomes less and less. I would say, Dad, that as the radius of the circle increases, the curvatures of the circle become less and less, tending to flatten out more and more."

"Exactly, Janet," interrupted Harding. "Now, Janet, if that is true, what must be true when the curvature of the arc of a circle becomes zero—in other words, a straight line? Don't know? Well, what's the greatest quantity, distance, or amount called? Wouldn't the radius increase as the curvature flattens out more?"

Janet puckered her brow prettily for a moment and then opened her eyes wide in delighted understanding.

"I see it now!" she exclaimed. "If the radius increase of a circle causes a decrease in the curvature—or an approach to zero curvature—when the radius becomes big enough, the curvature will be zero. In other words, when the radius becomes infinite in length, the curvature will become a straight line."

"Exactly!" laughed the girl's father, shifting his position to an easychair beside a small table of books and drawing instruments. "Here, follow this drawing."

He sketched swiftly, exhibited his work and crumpled the piece with his concluding remark.

"A straight line is really the arc of a circle with an infinitely large radius. Hard to see, but true."

"Well, after that mental strain, I guess I'll be excused," said Janet. "Lots of tennis and things on for this morning. Will you be here for lunch, Dad?"

"Yes, dear. I'll have a couple of friends, so please tell Martha as you leave. Good-bye for now."

The pretty young girl gracefully tripped out and down the steps to a waiting motor car.

"A great girl, yours, Jim. Wish I had married, even if I had had your hard luck in keeping a wife from death. Fortunately you believe in eternity so you are not as lonely as you might be."

"Yes, Frank, I do believe in eternity. Study of God's heavens leaves little chance for any other belief—greater than nature is nature's law. There *must* be a control or guiding intelligence somewhere to keep the cosmos in order as well as the little point of existence we call earth. That intelligence we some of us call God."

"Say, Jim, do you know what I believe this affair last night means? Well here—suppose we consider what happened. I saw a large ball of light at the zenith which suddenly divided and the two parts receded from each other. The photo shows that the sum total of the motion of these points describes a hyperbola. Now the chances are infinity to one against such a thing happening. I believe that a single body described that path."

"But in that case, Harding, you could not have seen a dividing of the body, and besides, I saw the two bodies. Anyway, you would have witnessed the approach and passage of a body as big as that had it been single and describing an hyperbola. I can't see any explanation."

"Where's you imagination! Listen. Did you ever hear of a body moving faster than light? No? Well, neither have I, but does that prove it could not? Certainly not. In fact, as we modern scientists view nature, speeds double that of light would be possible—yes, probable under the correct conditions. Now witness this little sketch I made."

He placed the pencil at the upper right of the pad of paper. Beside it he placed a red crayon and brought both across the paper in an hyperbola, ending at the lower right corner of the paper.

"The pencil is the body we saw. The red is the light constantly being emitted from it by its luminous ball. We stand at the zero point here at the maximum point of the curve; that is, we are here on earth observing this celestial visitor curve into and out of our vision—a wandering star I believe it to be. Now suppose, Jim, that this visitor was traveling faster than light. Say ten times the speed of light. At what point would we first see the visitor? Why, at the point in its path closest to the earth. Therefore, in this case, since the light of the approaching visitor would always be *behind* it, the body would reach us before its light. *Voila!*"

"I don't see it yet. What's the point?"

"Why, Jim! I didn't think you were that dense! That wandering star appeared at the zenith *before* its light, then we saw it *there* because it was closest to us, and as it departed again on its path we saw not only the trail of light it then left—going down to the right out of the solar system—but also the trail of light that it left behind it in coming *into* the solar system, which was just beginning to catch up. Now, of course, this would make it appear as though the brilliant mass at the zenith divided and went both ways—we are seeing both the light from the incoming and the outgoing path! Think of it, man! We were seeing that star both coming and going all at once—incredible but perfectly possible, and I believe true."

The two men sat silent for a moment, each trying to comprehend the implications in this conclusion.

"Marconigram, Mr. Harding."

The housekeeper handed her employer the message. He opened and read it, turned to the desk and made a few calculations, looked up some logarithms, and by use of a table finally obtained the answer to the problem he was working.

"According to this information from South America and our data here, that visitor last night came within roughly a billion miles of our solar system. That's pretty close, but of course, it may not be a dense enough body to affect our system much."

He calculated a little more and announced that the body was apparently of enormous size but not as dense as our own sun.

That night a search was made for the two points of light observed the preceding night. None could be found. About 12:30 when all the mists had cleared and the heavens blazed with a thousand glittering stars, all the astronomical world was startled by the repetition of the phenomenon of the preceding night, performed on a truly enormous scale. The flash of an enormous blue-green ball of light at the zenith, its apparent division, and the streaks of light in each direction showing what was, in appearance, two separate parts receding, but what really was the appearance of the light from the incoming and outgoing paths of the giant visitor.

Suddenly the entire earth trembled, heaved slightly and shuddered, throwing buildings to the ground, opening great cracks in the surface where whole cities dropped out of sight.

Amazed beyond the power of speech, the observers of stars beheld the sun, old Sol himself, appear over the horizon—but great God! the sun was rising in the north west.

What great cataclysm had befallen old mother earth, or was the sun himself out of place?

Suddenly the whole sky began to dim to twilight. The sun remained but his size was diminishing, his light failing. The orb remained above the horizon but seemed to be circumscribing a circle horizontally about the earth! In two hours the size of the sun was only half what it usually appeared to be, and the light was dim as late dusk.

Apparently the sun was traveling about the earth every eight hours, growing smaller and more and more dim each time.

Was the sun moving or was the earth sweeping out into space, darting after some prey as a hawk sweeps down from the skies and darts after an unfortunate

CARL BROWN brooded throughout the day of April 12th. He stayed close to home, giving every chance for the message to come, which he hoped to get. If none should come, his mind was made up—he would most certainly try to do just what he had said. His machine should have a trial; and if he could get the earth out of her orbit, he'd do it!

Nine P.M. and no message. The young inventor strode restlessly about his work shop. He thought over all his plans for a happy home, and then those of moving the world. Carefully he weighed them against each other. Which was worth the most? Should he swallow his pride and return to his sweetheart for forgiveness? No! She had always refused to give him any definite promise. He was too old a fellow to be treated as a child. He would give her a scare if she didn't come with a promise.

Ten o'clock and still no message. Half an hour later the young man strode to the new part of his work shop. Standing amid a maze of motors was a shining giant of glittering arms, movable discs, and hammer-like affairs. Truly imposing was this monster machine yet every part seemed to be one with its neighbor in a massive unit of parts. Parts as small as pins stood by the side of great blocks of chrome steel; under both might be found bulbs containing fibrils of finest platinum with grids and plates of processed molybdenum-aluminum alloy. All the parts of this colossus were placed in compact style, each apparently dependent on the other for its function.

With grimly set jaw and wildly flashing eyes the master of this massive child of his brain threw the master-switch on the slate switchboard to his right. The low drone of starting motors pervaded all the air. Gradually the hum rose in pitch to a whirr. With a click a secondary switch clipped into place. Siren-like the whirr rose to a shriek and the air thrilled to many high-pitched, screaming motors. Almost without a glance at the many meters on the control board, Carl moved the sliding contacts of a series of coils at the base of the machine. The tubes amid the metal parts slowly came from darkness into ruddy glow, finally giving forth a blue-white glare, and flooding the room with stark, sharp shadows of motionless bars and rods. A final thrust at one majestic, stately lever of brightest chrome-plated steel and the master had his servant in full action. With crash of steel against steel, the quick flash of scintillating arms of burnished metal, the doom of earth commenced to become real.

Enormous black shadows danced and flashed about the room. Great patches of glaring white rocked to and fro on the ceiling. A look of awe spread over the features of the young man, ever changing in the ghastly light thrown by the flaring bulbs in the demon of energy.

For two hours the machine continued to roar, splashing light over the whole room. The heat was intense. The outside atmosphere became chill. Frost formed over the roof of the workshop. The human operator shivered violently. He slipped on an overcoat. This was to be expected. It showed that the machine was working. Carl stepped outside to see what effect on the surroundings this experiment was having. Suddenly he was startled by a brilliant flash high overhead. Glancing quickly up he saw a ball of blue-green light divide into two parts which swept apart in a great arc, becoming gradually smaller and farther apart. Wondering a bit he stepped back in to observe his whirling destroyer.

The machine groaned, strained at its anchor bolts, and shifted its speed to an even higher pitch of confused shrieks and throbbing poundings. Suddenly the dark outside the workshop became light and lo! the sun rose over the northern horizon! With the light came great upheavals and tremblings of the earth. The buildings in the distance tottered and fell, leaving only great clouds of dust which floated slowly up and away. Around the horizon the sun moved from east to west, just above the horizon line. Slowly, as the dumfounded inventor watched in silence, the light of old Sol faded and by the end of an hour the apparent size of the disc of the sun was much smaller than usual. Could it be that his machine had worked so well so quickly? Carl Brown looked his terror. He had not expected such violent action nor such nearly instantaneous response to the change he had made in the energy relations.

By the end of five hours the sun had become very small. Light was nearly gone from the earth. Not only had the orbit of Mars been passed, but the earth had plunged through the asteroid belt. Several enormous planetoids had struck the earth with prodigious thumps, causing local earthquakes in the countries where they struck.

As soon as he understood what was happening, Brown reversed his machine, but to no avail. The bonds he had so weakened by his machine were now so far stretched and weakened that the momentum the earth had acquired overcame all tendency toward sunward motion.

Earthquakes, tidal waves, volcanic eruptions, shifting of mountain ranges, and sinking of whole sections of continents followed in a terrifying series. Large parts of the human race were being wiped out. The earth, lacking the sun's heat, was rapidly growing cold. Fortunately the atmosphere remained with the earth and was traveling along in normal form with the spinning sphere though windstorms were numerous. Human existence became a matter of the survival of the fittest. Strong men killed weaker men, women, and children in their efforts to save themselves. No matter, it seemed all would soon be dead from cold. Northerly bodies of water froze solid. Even the salt seas congealed. The hot equatorial belt saw an inch of ice on its once lukewarm ponds and streams. All natural light was gone. Darkness was on the earth.

FOR three days conditions became steadily worse. Light was completely gone, and the deadly cold of space was sapping up all the heat which the earth had stored up. Long since the solar system had been lost in the far distance. Old Sol became a faint star, observed with terrified interest by brave astronomers, who stuck to their posts as observers of what was going on.

By now the truth was suspected. The combined effect of the monster wandering star, which passed so close to the solar system along with the overbalanced energy conditions of earth and sun, had resulted in the visitor attracting earth irresistibly out into space, on a mad race through the cosmos. The pull of the sun and of the wandering star had nearly torn earth asunder, but finally the solar attraction grew too weak to affect the racing planet any longer. The earth was tearing after her new affinity with all the speed she could muster. Astronomers calculated that already her speed had reached that of light. During the entire time sharp watch had been kept for the appearance of the wandering visitor, who had so rudely torn from Sol his child Earth. If humanity survived the interstellar cold which was gradually numbing everyone, it might have the pleasure of being scorched to cinders by its attractor once it caught up with it.

The sixth day brought cheer to human hearts, for the earth was speeding fast toward her captivating star, albeit it would be a considerable time before it would get close enough to feel the glow of warmth of her heat. Strangely the earth seemed to be entering a shower of dust, said by scientists to be the tail of cooled matter streaming out into space from the glowing star the earth was rushing after. With the meteoric dust came a little heat, fortunately, for all water was frozen on earth's surface. Men lived at the equator as Eskimos. Only a tattered remnant of humanity remained, but that remnant had great joy from the announcement that earth would soon be in a warmer region, even if it continued to get warmer and warmer, till it was consumed in stellar mists hotter than man could conceive of.

By the end of a month, time being kept only by mechanical means, such as clocks and watches surviving the horribly destructive effects of earth's convulsions during her struggle to leave the solar system, the climate had become again somewhat livable. The meteoric dust falling on the earth was becoming much more noticeable and its concentration and speed had caused a sort of phosphorescent luminosity on the side of earth facing the runaway star. Fortunately, earth continued to rotate on her own axis. This provided all parts of the globe with hours of light even though it was feeble. Vegetation had ceased to grow and had frozen to brown, withered stalks and leaves. Men hoped to see the return of these "when they reached the star." Every hope was held for the recovery of vegetation now that light was returning.

At the end of forty-five days, with food supplies running low, man was thrilled to hear from observatories that the star had been sighted, and that the earth would have normal illumination within two days. Fears were held about what would happen when the earth came closer to the leading star, now universally known as "The Thief." Certainly the size of the attracting star would draw earth into her vortex and consume everything to cosmic dust. It was finally agreed that when such a time was reached the machine which had caused this catastrophe should endeavor to force earth away from The Thief. Some wished to try immediately to get free, but upon mature thought, realized that the most they would accomplish thus would be to strand themselves in the midst of interstellar space. That would indeed be a "cool" proposition. None cared to float eternally through space, prey to every wandering body, though doubtless all would be dead after three days of such isolation.

Astronomers reported much of interest. First of all the familiar constellations had disappeared. Some of the same stars were visible, but the shape of the constellations so long known to man was gone, and with the disappearance of these "sky marks" the astronomical world was lost, as far as charting the earth's track through space was concerned. The speed had so increased that no further efforts were made to determine it. Everyone was satisfied that the earth was going too fast to be stopped by anything but a miracle. The change in arrangement among the now unfamiliar stars was visible each night, although the term "night" had changed its meaning.

Scientists informed the million and a half survivors that the earth was leaving the universe in which she had lived so long. She was about to plunge from the edge of her natal galaxy into boundless black intra-universal space. Perhaps she would survive, perhaps not. The speed of The Thief was an ever-increasing marvel to humanity. Too dazed at first to realize anything but the personal misery and suffering brought on by the extraction of earth from the solar "home circle," man again began to notice what was happening to the world in general. The problem of the coming trip through the black void of starless space held every imagination in constant suspense. Could earth survive such a trip? Whither, pray, would this Thief fetch her loot?

THE existence of other universes besides the solar galaxy had been long known, and now in the eve of earth's life, man was to make the great voyage through God's house from room to room, perhaps from cellar to garret. What would another universe reveal after passing through it? Shortly they were to know, for within a week the news went abroad that on July 6th the earth would make its dive from the edge of the solar system into the inky waters of the black cosmos.

The night of the great event found everyone abroad, watching. In the direction of The Thief astronomers reported an ever-thinning grouping of stars. No great change occurred as Old Mother Earth flashed past the boundaries of the star group which had for so many millions of years given her a home. Millions of stars behind, black night ahead, except for the ever-increasing glow of warmth from The Thief.

Man had again become established in habits and was fast building him a temporary home. It was a universal agreement that time should still be recorded by the mechanical chronometers in hours, a twenty-fourth of a solar day. The days of the month were kept officially, although the general public had long since lost track of what day or month it was. Some declared it had been a year since they left the sun and planets behind. Others swore it had been only a month.

Vegetation again began to grow. Food became plentiful and man began to come back into his own free life, with the change over former life, that labor and work in general was divided, so that everyone had an equal minimum amount to do during each "light period." Since there were now three periods of light and three of darkness in every forty-eight hours, this meant a rather even continuous grind, but no one minded, because of the equality of distribution of the fruits of labor. Each shared with the other in the temporary government, the agent used as distributing and regulating body. Man was building himself back into his world, but feared constantly the possibility of new catastrophes at the end of a week.

The observatories reported the solar galaxy to be taking on a definite shape. It seemed to be a great pancake very much puffed up in the middle. As the earth raced farther away from it, this galaxy began to show a spiral form and appear much like a monstrous spiral nebula. Apparently all the stars in it were involved in a great whirling action. Doubtless these all were concentrating toward the center, slowly condensing to a more compact mass. Perhaps some day, eons hence, that group would coalesce into one or more giant suns and rush through space in new form. True, the whirling motion was not apparent to observation, but the shape and positions of the parts of the nebula-like affair left little doubt as to its similarity to the gaseous whirling nebulæ. Natural law, God, or whatever one may term the all-pervading intelligence that keeps the cosmos in order, apparently functioned in a definite way to create new suns and worlds—whether the material be luminous gases or fiery suns.

All through the month of August the mad pair, gigantic sun and infinitesimal earth, careered through space, leaving one universe far behind, an ever diminishing grouping of stars, and hastening toward new universes, ever seeking, never pausing, crazed with speed, veering not, but onward in its chosen path. The earth had met no floating masses, none of the cosmic dark matter floating in space. Her leader, The Thief, cleared a wide path sucking into its maw all matter that it passed near. Fed on these pieces of matter, the giant grew ever larger. In turn the shower of meteoric dust on earth became more noticeable as time went on, and men found themselves gaining in weight without apparent increased size of body. The earth was becoming noticeably larger. The moon was taking on a new appearance. Many of its craters were covered over. There appeared to be a bit of vegetation on some of the hillsides. Perhaps low forms of life which had always been there, were blossoming under the more favorable conditions for growth from this warm shower of dust.

At length announcement came that in the dim distance a new gathering of hazy light could be seen. This meant the approach to a new universe. What might it hold in store for them? Would the flying pair sail in and out again? Would both perish there?

Shortly man saw unfold before him a new group of stars, gorgeous in their colors. Astronomers reported every color of the rainbow represented and many hundred shadings of the same.

When the first outlying stars had been passed in entering this kingdom of color, distinctly disconcerting news was sent abroad. Calculations and observations showed a large cluster of slowly dying suns to be directly in the path of The Thief. Now if these remained, there would be a mighty collision and the earth would shoot into a sea of incandescent gases so hot from the impact that not a wisp of any molecule of earth would remain. Even atoms would be disintegrated. It was not pleasant to think upon, and religious fanatics seized on it as the "promised" destruction of the world by fire. There were a few who held themselves silent and who refused to believe with the average, that unless a miracle occurred, this was the end of the world. Even the well-ordered government failed to hold the people to the every-day tasks. There seemed to be no intelligence left in man.

THE date set for the collision arrived and again all mankind sat in their box seat to witness the play of the hour, where the actors spoke with tongues of flame.

At the appointed moment a glaring light filled all space, pure white in color it was, and so intense that fully half the earth's peoples were struck blind for days. A wave of heat enveloped the earth, and had it not been for the protecting blanket of atmosphere, every living being would have charred to blackest carbon. Many died from the heat. The waters of the sea gave up great clouds of vapor and mankind drooped and wilted in the

hot steam-laden air. Vegetation wilted, and every living thing was partially suffocated from the humid air.

Twenty-four hours saw a change and the temperature dropped to summer heat. The earth was bathed in a luminous ether. Light fell from all sides upon the sphere, which hurled itself through this fire-mist by force of the momentum it had won throughout these months of winging through space.

Again the Click Observatory theorized, giving the world new knowledge of its condition.

"Jonesly," said Harding, "I tell you I'm right. We're through the worst of it. We're coming out the other side soon. This continual day is going to fade soon. I wouldn't have believed it possible, but so it seems to be, anyway."

"Why should we expect to ever get away in that case? I can agree that probably you are right."

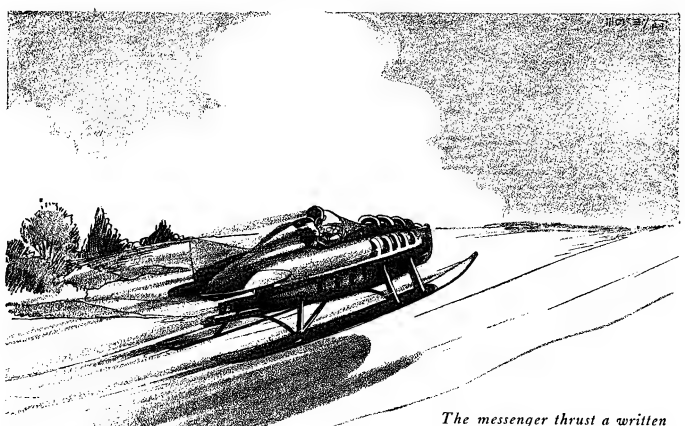
"Here." Harding drew sketches rapidly. "This earth has been accelerating constantly since last April. Now we've reached a speed that cannot be measured except in units of light speed. Our Thief must have been going that fast too. Now what becomes of energy of motion when suddenly stopped? Why, it either turns aside or develops heat. When our monster star struck those nearly dead suns in our path, the heat and energy evolved simply threw out the matter to such enormously large distances that it was so attenuated, that we could pass right through it without great harm like going through the tail of a comet. We don't notice it. This, of course, was different but here we are, almost past our Thief who is no more. He has been destroyed and in some billions of years hence will condense with those suns he gasified to make another giant sun. We pass onward; our gravity pull for The Thief is practically gone. See, the mists clear."

"Great God of all—look!"

Before them in the jet black heavens lay a veritable jewel box and directly in their path an especially fine grouping of stars appeared. They enlarged in size even as the men looked. Brilliant beyond belief and of many hues were these stars.

"Brown, looks to me like your machine will have to catch us a sun now that The Thief has been destroyed. We are free of it, yet where will we go? We must have heat."

Jonesly spoke to Carl Brown, for the whole scientific world had united efforts after the great thrust out into space. The machine had been saved and revamped so



The messenger thrust a written note into Georgia's hand and flashed away on his glittering autosled. She watched with eyes aglow. Her Carl had made that miracle vehicle possible.

that if occasion offered, it could be used again. Enlargements and improvements made a really formidable affair of it.

"I will try to get us a parent sun as we enter this coming universe. Georgia, I ask you to pick out from what you see, the star you would most like to have as your sun. When I spitefully threw us all out of our place, I vowed I would atone for my misdeed. Now help yourself to a sun and I'll get us there."

The girl spoke softly as she pointed off to the left horizon.

"Do you see that gorgeous cluster of five stars? I want it for my suns. I want more than one star. We have billions from which to choose, but those I chose from all."

"They will be yours if we live to get there."

Carl hurried to the central power station to give orders for the try. It would be like casting a rope for a post—if only the loop would drop over you star cluster.

Two hours brought the star group nearer. Six hours passed and before the world lay a magnificent group of suns. Five of them there were, four arranged in two pairs, each pair rotating as the ends of gyrating dumbbells, and these two pairs rotating about the fifth mammoth sun as a common center of gravity. The central sun was white, the members of one pair were rose-red and sea-green respectively, and of those in the other set one was a soft yellow and one pale blue. Truly a transforming sight!

Day and night Carl Brown labored to bring the earth into this group of suns, so as to establish it as a regular planetary body. Gradually the task became more and more delicate. The earth was fast passing through this small cluster and if earth hoped to establish herself as a dependent body, the act must culminate nearly at once.

"Carl dear, don't labor so. You must rest. It has been seventy-two hours since you had sleep and no man can stand that pace. You'll collapse."

GEORGIA had become a faithful companion to her beloved scientist sweetheart. He had rapidly ascended the ladder of scientific prominence and by dint of hard study had become skilled in the laws of celestial mechanics, primarily because he had known that this moment would arrive. Some day he had known that he must try to capture a sun instead of repel one. The time had come and his dearest possession, Georgia, his promised wife, was ever at his side helping all she could.

"Georgia, darling, you don't know the moments I slip off into dreamland for three winks and a sigh. I really am not so in need of sleep as you think.

"Look! We are stopping. We've been slowing down rapidly since we lost The Thief. I presume the gravitational pull of that great gaseous nebula formed by the collision has been acting on the earth with a steady powerful drag. At any rate, we're not to pass out of your chosen star cluster. I shall endeavor to give earth a position in that cluster that will thrill mankind till the end of time."

"What do you mean, my boy?"

Dr. Harding stepped into the room just in time to hear the last of Carl's comment. He continued his question.

"What do you intend doing? I must say I am already thrilled at the truly gorgeous sight we have before us in these stars."

"Dr. Harding, if you will give me your help, I will show you by actions what I intend doing. Please draw a rough sketch of what you have found this group of stars to be and indicate the paths and directions of motion of these five colored jewels, the Lanterns of God."

"Carl! So shall they be known—The Five Colored Jewels, Lanterns of God."

Georgia beamed on her lover with pride as never before. His many sided soul was ever revealing a new glory to her. How could she have been so blind and narrow in those days so far past? She had nearly thrown away one of the finest things her life had ever known. How little people's minds had been, back in those days before Earth's migration!

So the men went to work in the ever-increasing laboratory where masses of machinery screamed and hammered in the great effort to capture the star group as parents. Days held man in suspense—the task was one of such importance and such delicacy as to cause entire humanity to walk tip-toe and to speak low lest it should disrupt the delicate web of magnetic lines of force being slowly woven about the Lanterns of God, as the five stars had been named.

Almost imperceptibly at first and then with a precipitate rush earth skidded from her blind rush outward and headed in a great arc around the star group. Once more the earth was warmed, once again light fell with blessing on her cool crust. Vegetation sprang to life almost over night and when at the third day earth passed closest to the cluster, flowers bloomed as by magic. The scientific world stood gaping. Never had there been such growth in the history of man. But more wonders were to follow.

Within a week earth had made four rushes into and out of the star group, oscillating on a large elliptic path, ever concentrating its efforts to come closer to the stars it sought as suns. The men who controlled this motion were besieged to hurry to an end and locate earth in an orbit so that life might once more settle to normal. The reply was always the same.

"We cannot hurry matters," explained the young scientist Brown, who was formerly called a "crazy inventor." "Should we attempt to form our path into a permanent one immediately, the forces so expended would doubtless cause another series of earthquakes, eruptions, and might possibly cause a universal flood from the oceans racing around the earth. We might even burst the earth asunder, for the strain of the breaking away from the solar system had weakened considerably the crystalline structure of earth's lower crusts. An error of a few seconds in our calculations, or a change of a few minutes in our celestial path might plunge us into the center of one of the Lanterns. We cannot risk all for the relief of temporary sufferings. *Man must survive;* therefore he must act cautiously."

TWO years had passed and at last the renowned astronomer, Carl Brown, announced that he had completed the work of establishing earth in her new orbit. The orbit, he declared, was circular and passed at an angle of thirty degrees to the plane of revolution of the pairs of Lanterns about the central star, in a regular manner about the center star, at a distance of roughly one billion and a half miles. The orbit lay between the central sun and the two revolving pairs of stars, so that when one-half the earth was toward the central sun, the other half looked upon a pair of the Lanterns slowly gyrating about end for end.

"See Georgia, my beloved wife, always will the earth have light—if not from one of the Lanterns of God, then from another. As the white Lantern sets on one horizon, two of the Five Jewels rise on the other, flooding the dusk with glorious colors. Off to the left you see the other pair, gyrating and sailing majestically through space. Soon we will come nearer them and our lives will alter some, because of the change of light. Thus will man ever have a thrilling sight before him, never darkness—always light, symbolical, I hope, of the liberated human race, for we have discovered that our white Lantern sends out streams of energy which we may collect and use for labor, much like electricity."

"What has been determined concerning the orbit in which we travel, husband of mine? I care little though, as long as you are here to travel round it with me."

"To be prosaic," smiled Carl, "we will go a little way into the mass of detail we have accumulated in the last two years.

"First let me confide in you. I am not what I am taken to be. My knowledge of the heavens has come to me only in this wild ride through space, and while I am hailed as a master mind by some, I know my limits and how frail is the pillar of glory on which I stand. Nevertheless, I stand on it with pride and will ever guard it against a rude attack."

"I don't believe it, Carl. I believe you are really as great as you are heralded as being. Man is as adaptable as any other of nature's beings. Every living being adapts itself to the conditions in which it finds itself. If not, it dies. Witness that flat fish of the ocean which travels always close to the sand at the bed of the sea yet neither eye is down. It is born with an eye on each side of its head. Because it has no use for this eye on the sand-ward side, that eye shortly migrates through the head to the upper side of the head beside the eye originally there. Thus it has both eyes for use where it needs them. This is a pure case of adaptation of life to conditions.

"Now you are no fish, dear heart, but the same general laws apply to all of God's creatures. You were thrown into a sea of new conditions and your intellect rose to the occasion, grasping all and making you a leader. It was not accident, but the survival of the highest type of life, that left you here and destroyed so many other people. But enough of that—what about the new abode of earth?" There she paused.

"Listen then to your superman, as you will insist I have become!" Carl joked and then continued in more serious vein. "Our earth has become established on a new orbit here, between the Lanterns of God, the length of which is about ten billion miles. The path of the earth in the solar system was roughly five hundred and eighty-three million miles. That old path required one solar year to traverse. This new path requires 5.76 of our old years for earth to circumscribe its new circle about the White Lantern. That means that the earth is now circling the new path at an orbital speed of roughly

fifty-five miles per second. Frankly we've been here so short a time that we are uncertain about such figures. Thirty years from now we'll know more—much more. Our present orbit is about a billion miles inside the circular path of the two pairs of Lanterns. The size of the Five Jewels is so great that plenty of heat and light reaches us here and it is believed that these suns are very young. The Great Watchman has but recently lighted these Lanterns on the highways of eternity. Vegetation has grown so miraculously because of the constant light and energy being poured out to us from both sides. As we whirl around our orbit we will gradually shift from one set of the dumb-bell-like Lanterns to the other. See, Georgia, the Great Ruby is eclipsing the Peacock. It will be another week before that eclipse is passed. One end of the dumb-bell is toward us and, in rotating end over end, it obscures the far end from our vision. These end over end gyrations occur ten times in one of our revolutions about the white Lantern. Each pair rotates at the same speed and each completes its trip about the central sun in eleven of our solar years.

"What are we to do about the vast change in our living conditions?" said she. "Are you, my husband, going to continue to try to live without proper sleep? This continual light, while not hard on the nerves, leads you solar creatures into bad habits of wakefulness."

The stern yet tender-faced young man of destiny became thoughtful.

"We have not determined what we will do as yet. It is thought that since the world itself now revolves once in twenty-two of our old solar hours and since there is no night, some new conditions of rest must establish themselves. As a matter of fact, we do not need as much rest as before. Have you noticed how long you can work here without tiring? We believe that the light or energy rays coming from these Lanterns of God are of a more active nature than those we received from old Sol. Being younger stars, that would be possible. Matter has not yet become definitely established in those balls of glorious light. Perhaps energy forms and transformations undreamed of are continuously being accomplished. We know that the Diamond sends us a constant supply of electronic energy of an entirely new type. We use it, but do not understand it. It was the same with electricity when that form of energy had its day."

"MESSAGE for Mr. Brown, ma'm."

The messenger thrust a written note into George's hand and flashed away on his glittering autosled. The woman watched with eyes aglow. Her Carl had made that miracle vehicle possible. The mechanism he had never divulged to anyone. Attempts to pry into the motive box, a small unit no larger than a cigar box, had always ended in the loss of a life. Every sled bore a warning against tampering, but some curious souls were still foolish enough to let prying fingers bring their destruction. Carl had said that the basic thing was a nullification of earth's gravity and an electronic stream for driving the sled forward. Both the strength of gravity pull and the speed of the sled could be controlled by two simple sliding levers at the finger tips. An individual could actually rise a little way into the air and speed across the fields and hills without reference to the roadways of old.

Returning to the breakfast room, Georgia met her husband and presented the note.

"My dear!" cried he in great excitement. "Listen to this: 'Have located what we believe to be another planet in this system. Come at once.' The message is dated at Click Observatory and confirms our suspicions. We have noticed some very peculiar antics of earth in parts of her orbit. This led us to believe that very probably there were other larger dark bodies than earth in this system of suns. It is only reasonable that there may be some planets although these must be very young suns. Of course, it depends on what theory one believes regarding the origin of such systems of suns and planets. The Laplace theory of the planets originating from whirling rings of matter left in space by a rapidly contracting whirling nebula does not seem to hold water. The other theory at present prominent seems most likely."

"That is the planetesimal theory, is it not? What are its main points, Carl?"

"It is based on a spiral nebula. These nebulæ are thought to originate in two ways. Either two bodies collide in space, just as The Thief did with that group of suns, and gasifies or is thrown into cosmic dust, or two hot star bodies pass too close to each other, and by the gavitational influence, one on the other, cause a tidal eruption of matter from both stars. This would stream out into space as the stars traveled on in their paths. Arrhenius has suggested that the universe is full of cosmic dust thrown out by the radiant-energy-pressure of incandescent stars. This dust is supposed to collide and gradually build up a gaseous nebula. There are two distinct types of nebulæ in space, so the first two theories may form the spirals and the Arrhenius theory account for the type of nebula whose spectrum shows it to be entirely incandescent gases.

"Either way you take it, the planetesimal theory has these gigantic mists of matter slowly condense to the parts of a system such as ours. The arms of the nebulæ generally have knot-like groups of matter which are thought to continue to build themselves up by gravitational attraction of matter at the expense of the surrounding smaller aggregates. Ever becoming larger by the impact of the particles of matter showering it from all sides, the planet being born becomes hot and if large enough, through continued growth, it becomes gaseous or liquid much as Jupiter was, or Saturn. The central group of a nebula, being largest to start with, gathers more matter than the others and so becomes larger and hotter than the others, since most matter means most impacts during collection. The large bodies, hotter at the beginning, remain incandescent, long after the small bodies have lost their heat by radiation.

"Our own earth still receives matter from space. Some hundred million tiny meteors are swept up by Mother Earth each day, it is estimated. This matter is supposed to be some of the remnants of our original nebula."

"How magnificent an idea!" said Georgia. "We are still in the nebular stage, albeit very near the end! Cosmic history is being made by us, now! One seldom thinks of it that way. Carl, what a truly grand play man is audience to—the formation of worlds. Are there many such in the universe?"

"You have seen the Pleiades, or Seven Sisters, have you not, Georgia? Well, large telescopes give us pictures which prove that this group is a nebular group in the far advanced stages. Although well formed, the main star bodies are gathering in cosmic veils that stretch

from star to star at present. A million years hence, perhaps, they will have cleared to brilliant individuals, having sucked in all surrounding matter by gravitational influence."

"How wonderful. But, dear, you must go at once to the observatory. They will need you."

"You honor me beyond my deserts. I shall go immediately, to be gone a week or so."

THE airport at the observatory loomed in the far distance as Carl Brown winged his way through the colored dusk toward it. The sapphire and golden Lanterns illuminated the earth in beautiful soft light and far off on the horizon appeared the other pair of Colored Jewels long since left behind by earth in her dizzy rush about the central sun.

Alighting at the port from his aerosled, the young inventor hastened to the observatory. Here he was met by a group of enthusiastic astronomers who conducted him to the observation platform and pointed with excited gestures to the clear image of a planet in the field of the telescope. A dull gray it was in color, but with unmistakable polar caps of snow and ice much like the appearance of Mars, back in the solar system.

"The fact that we have light here all the time makes observation very difficult. Fortunately, the Colored Jewels do not give such intense light as the White Lantern. Were we faced all the time by that white light we would be unable to see any stars or planets and would be completely at sea as to all astronomical data. In fact, the science of star study would go by the board, for we could never see the stars about us, at least not with our present types of telescopes."

"That planet," inquired Carl, "have you calculated its distance yet? What would you judge about its ability to support life?"

"We find it to be about seventy million miles away, traveling in an orbit almost at right angles to us. We will never pass closer to it than fifty million miles. It seems to have a prodigious speed—about seven hundred miles per second."

Further study revealed that the planet was fast approaching its near point to earth and that the earth was responding to its gravitational attraction.

A week of observation gave a mass of detail concerning the new planet. It was enormous, but had a density much the same as that of earth. The last day of observation showed a peculiar jet or path of violet haze streaking away from the planet in such a direction that, if extended indefinitely, it would cross the earth's orbit. The probable meaning of it struck home in but one mind. Carl Brown meant to investigate this; if his suspicions were confirmed he would prepare the world for a grand piece of news. It meant either war to extinction or else advancement such as the world had not dreamed about. A great emotional lump swelled in the scientist's throat and his eyes flooded with tears at the high thrill he tried to subdue—if he could be the means of freeing mankind from the fetters of labor!

Returning home *via* air sled, the excited inventor confided to his wife his thoughts. She agreed with him, and they both settled to an impatient wait of six months or so.

Constant study of the heavens brought conviction to Carl Brown, and it was with great pride and excitement that he finally announced through the public radiophone that the earth was soon to be host to a group of visitors from the planet which had passed about six months ago. Whether the visit was to be hostile or peaceful remained to be seen. Many scoffed, saying that at last fame had gone to the head of the young inventor, who had skyrocketed into public favor so gloriously. Some believed implicitly in what he said and made preparations for receiving the visitors. Most people were willing to be shown, and if the visitors, or any sign of them, appeared, the public were willing to give Brown credit for having discovered the oncoming space traveler.

One month later a beautiful ether-ship circled the earth once and settled to the surface like a ball of thistle-down. Golden and burnished it was, fully a thousand feet long and a hundred high. Only one opening showed—a window at the very nose of the ship. Slowly a door opened, then a second and a third. After that nothing happened. No one came out; no movement could be detected about.

Before any moves were made, the prophet of the ship's visit was sought out. He should be the first to go into this seemingly empty visitor. Taking with him a large group of his fellow scientists, Carl Brown entered the body of the ship. The instant this group had passed in, the curious-minded followed, crowding into the ship.

It was after about two hundred souls had entered the great golden craft that the blow fell. With no warning whatever, the doors on the monster snapped shut, and with no further ado it slowly rose, pointed its nose at one pair of the Colored Jewels, and with ever increasing speed streaked out into space. With arms raised toward the fast disappearing ship, Georgia Brown stood in mute appeal to the Creator, but the Lanterns of God sailed majestically on, lighting the highways of eternity.

SOMEONE was shaking the universe, the Jewels were skittering off and their glow was becoming bright and light like Old Sol himself.

"Georgia, dear, come! Come, child! Stop your shouting."

"Carl! Carl! My husband!" cried the girl, as she reached out, grasping her mother's arm and the white sheets of her own little bed.

"You have been calling Carl for five minutes, my daughter. He is waiting on the phone for you. Hurry."

Georgia rubbed her eyes, smiled guiltily and hopped out of bed into her red mules and robe. Down the hall she flew to the phone.

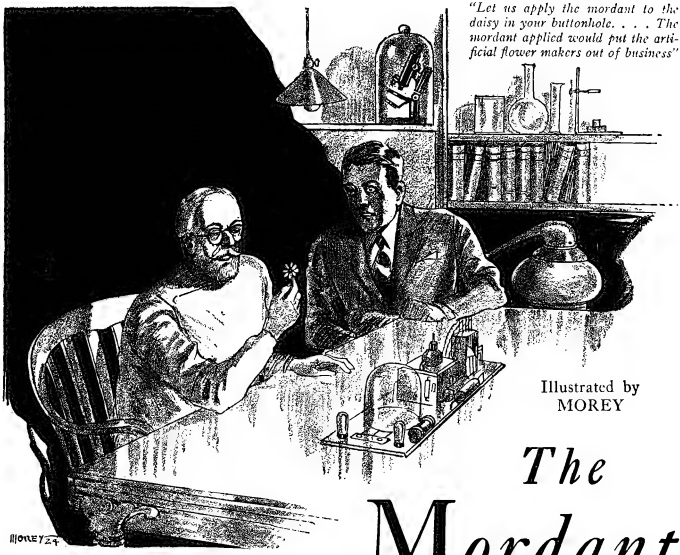
"Hello, dear—yes, yes, I am all right, but I just woke up. Tell me, did you work on your machine last night—the one with which you were going to send me to Mars, or maybe Jupiter?"

From the receiver came the eager voice of the young inventor.

"Yes, sweetheart, I worked on it, but the wiring got mixed up or something and it caught fire and burned completely up. The whole workshop burned. But don't let that bother you—I've sold my gasoline saver to the General Auto Corporation! It means a fortune for us—that is, if you'll forgive my mean streak of last night."

"Forgive you? Why, of course, Carl. It is I who should ask your forgiveness for my stubborn ways. How glad I am that terrible machine of yours burned. Promise me you won't build another one—if I promise to become Mrs. Brown in June, dear? Cross your heart? You're a darling. Don't forget, I want to hear all about the sale of 'our' gasoline saver. I'll be waiting for you tonight *before* ten o'clock!"

THE END



"Let us apply the mordant to the daisy in your buttonhole. . . . The mordant applied would put the artificial flower makers out of business"

Illustrated by MOREY

The Mordant

By Merab Eberle

IF the priests of ancient Egypt had discovered the mordant the awe-inspiring mummy would doubtless have been superseded by something more provocative of wonder—the human body preserved in its entirety.

Our museums would hold the bodies of men and women looking as though they slept—Egyptian princesses and Pharaohs would be before us in reality.

Without doubt, the morticians of our day would have made much of MacDowell's discovery of the mordant. There are still many people on whom the idea of death has such an effect that the holding of a body in a perpetual state of nondecay would seem to them the equivalent of an eternal and beautiful sleep. Death to such people would be no more to be dreaded than healthy slumber—provided they knew that they were to remain intact, bodily.

THERE are several mechanical means, like the movie films and phonograph records, to preserve youthful charms or a gorgeous voice or expressions of brilliant minds, but there is no growth, or even variation. What if some scientist should discover the secret of indefinite prolongation of life and a young body? Off-hand such a discovery would seem to be a boon to humanity. But is it? Consider the question carefully. Our new author apparently has, and gives us the results of his consideration in an excellent short story of scientific fiction.

MacDowell had different ideas about the matter. He sought for the mordant in his quiet little laboratories in the Black Hills, not because he wished to achieve preservation, but because he desired to see what might happen to those to whom a life of perpetual youth was given.

MacDowell believed in a soul and a God. Therefore he was not interested in the desires of those who wish the body to be preserved after death has made flesh useless.

I first met MacDowell before the world had accepted him. I knew that a follower of the celebrated Adams was in the

city. I had always been interested in the Adams' concept of disease and its cure. A good story, I thought, for the paper. Therefore I made especial effort to meet the scientist, MacDowell.

I was excited as I sped with my story to the city desk. Here was a man who was doing much more to eradicate disease than man had dreamed could be done. But the desk turned it down. Another advertisement by another quack.

Time and again I attempted to place the achievements of MacDowell before the public. No one would believe me. That is why the story of the mordant has not been told. The public, which denounces the newspaper for the sensational tales which it prints, would be surprised if it should learn how conservative the editorial desk can be upon occasion.

MacDowell in his earlier years as a scientist traveled about the country a great deal. His tours brought him to Youngstown three or four times a year. He always called me over the 'phone soon after his arrival and as speedily as I could leave my work, I would hurry to his hotel bedroom, where I would find him working, always working, with the strange instruments he had invented.

I enjoyed intensely these talks with the quiet, wonderful man. No one, by looking at his kindly face, would have thought of him as being above the average in intellect and achievement. Little could they dream that he was the greatest scientist of all time. There was no pretense in him. Sandy Scotch hair rode stridently above a sandy Scotch face. But, different from those of most Scotchmen, his lips were spread in an almost perpetual half-smile of forgiveness and condonement. The human race was hardly to be understood in its small achievement by this man so lonely in his genius—so far in the vanguard of science that he marched a lone soldier—often the victim of wounds inflicted by his comrades at the rear, even ranking officers of science with epaulets and medals of honor bestowed upon them by an appreciative public. The human race was hardly to be understood by him, but with his half-smile he forgave its sins of commission and omission.

"I have found a mordant," he announced one time.

The fact was of no immediate interest to me. I knew the name "mordant" was given to a substance which would fix a dye on cloth and give it a permanency of color that would baffle the effects of many washings and the bleaching rays of sunlight. Other significance I could not as yet realize.

"You can help me in testing it," he stated. I was ready, for, having helped him in many of his tests, my sympathy with his work made me faithful even at times when the experiments failed to achieve the results he anticipated.

His thoughtful face took on a quizzical look. "If you realized the import of what I am saying you would not lie back in your chair in such evident boredom. Many have sought what I have been seeking." He paused and eyed me curiously. "My mordant is equivalent to a draught from the fountain of youth."

I leaned forward in my chair. Here was a great story. I knew from past experience that I could not use it—could not, though my words be winged by fire, get it past the conservatism of the city editor's desk, but nevertheless, my whole being throbbed to cadences of exaltation. Few know the fire that sings through the veins of a reporter when something new is made accessible to him.

"But how—what is it—have you?" My words tumbled forth breathlessly upon one another. Then calming myself I asked, half-sarcastically, "Has the object of Ponce de Leon's search been found?"

"Not quite," he smiled. His manner shamed me for my agitation and for my sarcasm. "This is nothing that can give life to a person through the centuries. I do not say that such a treatment could not be given, but I doubt the wisdom of perpetrating such a curse upon the human race which has enough tragedy within a normal lifetime."

He thrummed his long fingers idly on the arm of the chair in which he lounged as though he were not speaking of amazing things.

"I have an ether rate which, when incorporated with any living object, will retard the development of old age. At the same time I do not wish to put a stop to the rich mental and spiritual development which comes through the years. Imagine the rounded beauty of a woman grown wise and kind with years and yet possessing the sweet grace, the bright and flashing eyes, the rounded form of youth." His eyes grew bright as though he were envisioning loves of his early youth made beautiful again.

"Have you tried it?" I, seasoned reporter who interviewed presidents and movie stars without undue excitement, sat forward in my chair—my heart beating with swift, rapid strokes—my mind whirling with the thought of a race kept perpetually and beautifully young.

"On no person—on a plant. Let us apply the mordant to the daisy in your buttonhole. It still looks in excellent condition. The mordant applied would put the artificial flower makers out of business. The import of my inventions is tremendous. With this machine of mine," he touched an instrument lovingly, solemnly, "the economic conditions of the world could be turned upside down.

"Right here I can say that the daisy is still in my possession—is still in very excellent condition—except where I have broken a petal or two. Several years ago I showed it to the curator of the New York Metropolitan Museum. He thought it was a fresh flower. I convinced him that it was not by leaving the daisy in his possession for a month. I had great difficulty in taking it from him. He was willing to pay me heavily. It would have a place all its own. My name could be blazoned across the case in which it was to be shown.

"But I had enough money on which to exist and the daisy was precious to me. I have a love for the mysterious, the unusual, which amounts to a passion. In my possession are many strange objects assembled through the years. Many leisure hours I have spent with them—wondering, marveling—feeling immensity spin past me and the inscrutable approach interpretation. And the most loved of this collection is the daisy, for it is tied up with remembrances as well as with wonder.

"I am striving to produce a state of continuous youth in people," continued MacDowell. "True, I can keep them well. That I have already demonstrated to you. But they grow old. I do not wish to keep them from death—that is not my desire. But why should flesh become such a wretched thing to gaze upon? The mordant, I believe, will keep youth intact."

WITHIN me I felt welling up a vast desire to be treated by this mordant. Who has not felt the pang attendant upon seeing youth slip by? I was young

then—but had no desire to grow older. The man must have read my thoughts. He had uncanny powers.

"No, it is not for you—not yet—nor for me. The truth is that I am afraid of crippling my powers. I must do greater good in the world than I have yet done." He paused. His eyes peered into the distances and then he continued slowly:

"I have tested it out already—last year upon a morning glory in my garden in the Black Hills." MacDowell loved flowers. They proved quiet, unobtrusive friends and never waxed merry over what they judged to be the futility of his experiments.

"The flower trumpets did not perish. One by one they placed their glory on the vine. But note this well—this I feel intensely—the flowers came to full bloom, remained in full bloom. But beyond that they did not go. There was no seed. I am wondering if there can be a lack of mental fruition also. I need you in this work. You have the rare gift of intuition. Therefore the test will not be made on you."

"But, about the morning glory," I queried, "is it still living?"

"That would be difficult to say. It exists. The flowers are purple, but winter winds and heavy snows have torn and bruised them. No, I should say that it is dead—for it no longer grows and the spring brought to it no new leaf."

"And who is to be the fortunate victim of the mordant?" I asked, half envious of the person upon whom the test was to be made.

"That," he said, with his forefinger directed straight at me, "is where I need you. I wish to do no one harm. Unless the mordant brings good, the world is never to know of it. I have seen young, blooming mothers, upon whom I should have liked to test it. The idea of destroying their creative ability has deterred me. I do not wish to arrest mental development, so I shall not approach a scholar. I have come to the conclusion that it could be tested out to great advantage on some woman, who depends greatly on her beauty for the earning of a livelihood.

"I have no doubt that several of the stars of the screen would be glad to accept the test. There are operatic singers, actresses, who might for the sake of preserved youth be willing to undergo the experiment. But I have no way of approach. These favored beauties would think of me as a daring humbug. I might have difficulty in gaining access to them. My clumsy tongue could not induce them." There was a glint of merriment in his eye as he queried, "Could you do it?"

Rosa Celeste was my selection. You have all heard of her—the singer with the voice of golden fire—loved on the operatic stage for her grace of form and her ability in acting as well as for the divine gift in her throat.

Occasionally she would make concert tours and, as my especial lot on the newspaper I represented at the time was that of interviewing celebrities, I came not infrequently in contact with her.

Other stars had been made newspaper copy by me in the interim between MacDowell's request and my securing of Celeste, but I had been somewhat cautious in my approach. It is not pleasing to a man to have women look on him with disdain.

Celeste practically made the contact herself. Some chance question of mine made her exclaim, "But wouldn't we all want to drink of the waters of youth? To see these arms grow flabby!" She shuddered dramatically. "To watch wrinkles come along the face! To mark the sparkle pass from the eyes—nothing more horrible!" Celeste's eyes were famous. I can recall her as she stood there. Beauty seemed to pour out in radiance from her. What a tragedy—what a bitter tragedy—that such wonder could perish. The dull walls of the hotel bedroom—reporters have unquestioned access to many places—took on a glow with her presence.

"And what would you give for eternal youth?" I asked, admirably, I thought, keeping eagerness from my voice.

Her soprano rippled off delightfully into a tenor bit of opera. Her eyes flashed at me challengingly. Then I recognized it as Faust's acceptance of Mephisto's offer. The exchange of soul for youth.

"No less than Faust gave," she laughed. "I should be glad to give audience to Mephisto himself."

Here was my opening. Fortunate for me indeed. "What if a kindlier spirit than he could give you what you wish?" queried I. My tones took on depth, eagerness.

She caught my spirit immediately. I swung into the tale of the kindly man who had found the fountain of youth. Told her that she could be the one chosen for a test. Then I explained what might be the danger—told her of the morning glory that did not bear seed.

"But it blossomed, did it not?" she laughed. "It flowered. That would be enough for me. Who would wish their thoughts to find a full fruition if they were to be borne on a withered plant? Seed means nothing to me. It is not in the future that I wish to live—not in children—not in strange new thoughts. Tell your friend that Rosa Celeste desires to remain beautiful." She was dramatically lovely at the moment. Light flashed from her famous eyes. It was as though a thirsty person saw an oasis—a poverty-stricken wretch heard that he was the inheritor of vast wealth.

SHE was given the mordant. For a few years there is little to record of her. She was just as beautiful as before—just as popular—the idol of a public which paid its tributes in large audiences and by demanding of the press tales of a great favorite.

In ten years she was just as lovely as when the mordant was first given her. Like the morning glory vine, she took on new splendors. Each new blossoming of beauty added itself to the sum total. People commenced talking of her fadeless charm. When she came to sing in Youngstown I interviewed her and found her full of joy over the mordant—full of eager queries as to the welfare of her benefactor. Ecstatic over the fact that not one wrinkle detracted from the youthful contour of her face.

"Not a gray hair, my friend. I am still good to look upon. The men adore me. Do you not adore me? But why does the great MacDowell not give to others what he has given to me? Is he not satisfied with his results on me, his test tube?" She preened herself before the mirror.

"He is busy with other things at present," I stated. "There are little things like wars to be thwarted and plagues to be harnessed. Nevertheless, he is interested in the success of the mordant. But he is slow in his decisions."

I myself am impetuous in my nature—wish things to

come to a head speedily. Never could I have watched through the years the outworking of experiments as did this MacDowell. I could very well understand Celeste's attitude toward him. "When he sees so glorious a creature as myself, how can he help but think his experiment a good one?" she seemed to say.

In five years more of time—fifteen in all—there was a real change in the star. Her voice, while in some respects lovelier—seemed to lack a certain modernity. It remained impervious to the changes that come from without—from the great down-pressing of events. There was a certain quality to her acting which was no longer the fashion. Yet reputation bore her along at the same high place in the world's estimation.

She was charming—unbelievably so. Newspaper syndicates used her name at the head of beauty columns. They paid handsomely for the privilege of doing so. She endorsed cold creams and face powders.

"I need none of them," she confided to me, laughing almost wickedly. "But for those poor people who have not the mordant there is no other hope. I give it to them. The powders and the paints, the creams and eyebrow pencils may help for a while. But see—not a wrinkle—not a gray hair."

Of course her beauty was world-talk. With that I was familiar, but not with another characteristic of which I was soon to hear. It seemed that Celeste was becoming known for her sadness—that her face, so radiant in years past, had almost a look of despair upon it.

So I was not surprised when she sent for me, on one of her last appearances in Youngstown, to make inquiries concerning the mordant. "There is something within me which does not grow. I am a creature of utter loneliness. I am not at home with the youngsters of the day. I am not at home with my peers in age. I am bound to the past by some hidden force that will not let me go. Yet I keep a look of youth."

What change had come over her? Here was a magnificent womanhood—radiant—compelling. Yet it did not affect me with its glory as it had done in previous years. Was my taste altering with the passing years or had some subtle change affected the divine Celeste? Whatever this was—whatever its origin—I felt a strange pity arise within my heart.

It was then that I took counsel with MacDowell. He was growing old. I felt that fact keenly. Lines had been etched upon his face by the sharp pencil of time. Yet he was not using the mordant.

"As I feared," he deliberated. "The mordant keeps the years from bearing the fruit that is their right. Youth is not the thing desired by the creator. In the seed there is a glory beyond our seeing. Of our bodies come our children as fruit. Of our souls—growth of the spirit and eventually immortal life. That I believe. What means the withered husk of flesh after the fruit has ripened?"

I knew at the moment that there was a soul. The man had such a depth of meaning to his voice that, sceptic as I was, irreligious as I wished to be, I could not keep from thinking that there was a tremendous power which held the world in its hand and gave heed to destiny.

Something pulled my eyes toward the man. Old, I thought, of face—old, old and wrinkled. Yet, I paused in my thought, almost amazed that such an idea could have come to me, here was beauty too. A beauty, different indeed, but greater than that of Celeste's.

What was the light that poured from his eyes? What source did this radiant stream have within this man's being? I gazed upon a sight as glorious as a sunset streaming from behind dark, age-old crags.

What did this man possess? And through my mind sped the thought that I was gazing upon a soul—a soul so great that its grandeur and its luster could not be contained in the entirety behind the aging walls of flesh that gave it habitation.

Then I knew what I had found lacking in Celeste. What it was that seemed to take something of glory from her. The youth of the flesh could not be affected without injury to the soul—without drying up the very sources of the spirit.

The power of the heavens which has given youth its fair dwelling and its lure of fresh, firm flesh had so designed it that the aging of the body brought riches to the soul—or so it seemed to me at the moment. Perhaps all the sorrows attendant on decay of outward form and all the agonies, that come from gazing in mirroring surfaces upon faces that are no longer pleasing to the eye, are needful to higher development.

I found my doubt of the existence of a wise God suddenly shaken at the foundations. I trembled before my new knowledge—was shaken to the core of my being.

I WAS confused when MacDowell brought back my wandering mind by saying, "I can release Celeste from the mordant—that will be easy. But will she wish to be released? Her associates will leave her if she is kept beneath the influence of the mordant. Unreleased, she will be as forlorn as last year's rose left blooming in a winter garden. Can she forego beauty and youth? She feeds upon her power."

"You could release her without her being aware," I counselled. "That would be a kindly thing to do." I felt almost fatherly toward Celeste now, I who had been twenty when she was thirty and I who was fifty when she was still thirty—at least in the record of her years as placed upon her face.

"I doubt it. In fact, I believe that it would be the sheerest cruelty to give her over to the power of the years. I do not know what ravages might suddenly take place after the removal of the mordant. Celeste might suddenly become old in looks. Remember, she is fifty. To place a woman who looks thirty in a position where she would suddenly take on the lines and sagging muscles of half a century would not be advisable.

"It would mean that she could not grow through twenty years of time to a place where she might accustom herself to a change both professionally and actually. If Celeste asks for the release I shall give it to her. If not, she shall remain fair to look upon when you and I are withered husks."

"Can she die?" I breathed sharply. The thought of eternal life had once seemed sweet to me. But sorrow had made her home on my doorstep. Life perpetual no longer seemed desirable. And life with a stunted spirit a damnable, awful thing.

"Most assuredly she can die," he stated. "Even as you and I. But the body will remain intact."

Celeste did not care to let the mordant release its power over her. Occasionally I saw her—occasionally I heard her sing. Beautiful as ever—her voice fresh with an eternal touch of spring—not of the present spring, but of past and remembered springs.

"I do not wish the power to go," she sighed. "I could not bear to watch my flesh shrivel as I gazed into a mirror." Her eyes dilated with a wild terror. It was as though she envisioned such a process tearing her glory from her.

"Not that I should mind so much being dead." There was something almost childlike about her, pleading, terrified. "It seems to me that only in non-existence can I find peace." She leaned toward me with a soft confiding. We had grown to be friends because of the secret of which we were a part. "Sometimes I grow extraordinarily weary of it all."

I shuddered to myself, for I was fifty at the time—she was sixty. The thought of supporting an ecstatic youth in the fact of remembered trouble had little lure for me.

THE terrible storms on the Atlantic in my fifty-first year brought to her the death which she had longed for. The yacht on which she, together with several of society's youthful favorites, had set out for a joyous cruise was not seen again, according to the stories.

A wire came into the office, four months later, which said that the body of a young woman, resembling Celeste, had been found on a wild bit of the Maine coast.

I was no longer a reporter, but sat at the main desk, where the older men are relegated. The news editor—a mere boy of thirty—barked at me above the hurried clack of typewriters, "You knew her, didn't you? Suppose you get on the story. Give it a sob touch. Take a look at the woman."

A plane hurried me to the spot and I found the glorious Celeste lying still and cold on a cot in a fisherman's shack. She was a little bruised, but still serene and beautiful. Yet her clothes were torn and stained with many months at sea.

However, the story came to nothing, for eventually the yacht floated in on another bit of coast—a mangled thing—bearing within its ruins bodies made unrecognizable by time.

The newspaper would have nothing of my finding of Celeste.

Gray skies looked down upon a gray and rocky coast and the sea gull's cry mingled with the singing of the little band of fisherfolk, when Celeste was laid at rest.

Just recently the curator of the museum asked me again for my daisy.

The price offered had substantially increased over that of former years.

THE END

The Gostak and the Doshes

By Miles J. Breuer, M. D.

(*Continued from page* 1149)

an old, Victorian building. What was there in common between Vibens and Woleshensky? I drew a deep breath. The comforting realization spread gratefully over me that I was back in my native dimension. The gostak and the war were somewhere else. Here were peace and Woleshensky.

I hastened to pour out the story to him.

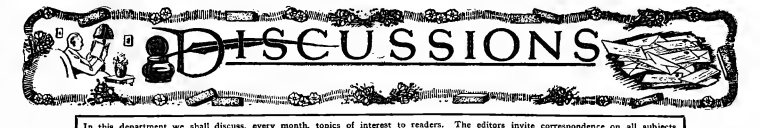
"What does it all mean?" I asked when I was through. "Somehow—vaguely—it seems that it ought to mean something."

"Perhaps," he said in his kind, sage way, "we really exist in four dimensions. A part of us and our world that we cannot see and are not conscious of, projects on into another dimension; just like the front edges of the books in the bookcase, turned away from us. You know that the section of a conic cut by the y plane looks different than the section of the same conic by the z plane? Perhaps what you saw was our own world and our own selves, intersected by a different set of coordinates. *Relativity*, as I told you in the beginning."

THE END

What Do You Know?

1. What is the effect of the interference of waves when they are of identical length and amplitude? (See page 1114.)
2. What instrument by producing interference of waves of light brings out the colors of the spectrum? (See page 1114.)
3. What is the relation of red and blue light waves as regards their length? (See page 1114.)
4. What do you know about negative gravity? (See page 1123.)
5. What is the percentage of salt in the water of the ocean? (See page 1124.)
6. Give an example of a living thing which seems to be part animal and part plant. (See page 1126.)
7. Can you give an example of relativity using as an illustration a moving train? How would this apply to our conception of the Universe? (See page 1142.)
8. What is the bearing of relativity on what we call movement and is motion conceivable except relatively? (See page 1144.)
9. Can you apply the idea of relativity of motion to yourself and the moon? (See page 1144.)
10. How long approximately would a trip to the moon take at the rate of 2000 meters per minute? (See page 1160.)
11. What forces is the earth subjected to which are retarding its motion in space? What is the title or designation of these retarding forces? (See page 1168.)
12. Can you distinguish between kinetic and potential energy, using the pendulum as an illustration? (See page 1170.)
13. What do you know about Jupiter's moons and the size of Jupiter as compared to the earth? (See page 1170.)
14. Can you give the character of the ellipse; its relation to a circle; its distinction from an oval? (See pages 1171 and 1172.)
15. If a comet entered a solar system on a hyperbolic curve and left on the same, when could we expect it to return? (See page 1172.)
16. Can you describe the planetismal theory and its relations to the formation of masses of matter by gravitation? (See page 1179.)



In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

SOME CAREFULLY THOUGHT OUT CRITICISM

Editor, AMAZING STORIES:

"The Other Side of the Moon," by Edmond Hamilton, appearing in your Fall 1929 Quarterly of Scientifiction, was very interesting and plausible until I finished reading the part where the earth men made the trip via the light beam, down through the crater of Copernicus, to the other side of the moon where the Turtle creatures lived.

It appears to me that not only would they lose all sense of direction long before they arrived at their destination but the passengers would have their feet pointing in exactly the opposite direction from that to which they had been accustomed on earth until they had passed the center of gravity.

Mr. Hamilton omitted a very important detail in his description which had me standing on my head a considerable length of the journey, or until I had passed the gravitation center of the moon.

After the Turtle men annihilated the worm creatures they rebuilt the ceiling on the opposite side of the moon, fearing a future generation of earthlings would release this same light beam and destroy them in exactly the same manner, by puncturing their ceiling, causing the oxygen supply to escape into outer space: Since the worm creatures had about the same population and large enough weight, it would be entirely feasible and natural to infer, on account of their age-old friendship, that the Turtle men would first make overtures with the worm colonies—on the scientific basis that everything is relative; water is a solid compared to air or helium gas. Mercury is a solid compared to water. Air will not support wood but water will. Water will not support iron but mercury will, etc.

Mr. Hamilton's story is absorbingly interesting aside from the scientific omissions which detracted somewhat therefrom.

I have been an interested reader of Scientifiction for about one year. Fiction may be written to appear real; likewise science may be illustrated in fiction form. To me, science illustrated in fiction form is more comprehensive. Prior to the purchase of my first Scientifiction magazine I was not much interested in science. Since then I have acquired considerable knowledge through your Questionnaire columns. I much prefer stories that have the ring of creative possibility.

A Hyatt Verrill in "Beyond the Green Prism," a second to "The Green Prism," differed in his reasoning when he explained that while in a reduced state he was compelled to construct a manabinite prism to find his former location and friend Don Alfeo. Since it was his belief that no more manabinite existed on his former world of life, how could he expect to return to Nusta, his bride, without a manabinite prism? He informed Don Alfeo that Nusta expected them within about ten minutes. It was not possible to transfer a solid other than animal matter; therefore, he could not expect to look for relief from the diminutive Mayans.

The foregoing objections, in my opinion, are some of the inconsistencies which should have been taken care of in the course of their story. Otherwise, they are most excellent scientifiction stories; but why should they detract therefrom by such impractical situations which could have been explained?

Ed. Miller,
1530 South Broad St.,
Philadelphia, Pa.

(It is a point with us to distinguish between the absolutely known and that which is in any sense a possibility. We admit that we sometimes cater the latter a little too far in our stories but you must remember that the great effort in making a magazine attractive to the reader and to get a good mixture of science and romance is not to be too avidly confined to the facts of the present day. Your very letter shows that you enjoy our stories. Mr. Hamilton's story, you say, is absorbingly interesting. Perhaps if we had confined it all to absolute present-day science, we will say not only of the present day but only what is known definitely at the present day in that we might have been very dry. So you must let our writers apply imagination to science in a sense as they do to facts. We also must state that criticisms such as yours are really appreciated by us. They indicate that one of our readers, at least, is taking our magazine as we wish it to be taken. Our intention is to make it a classic in its way, and serious criticism such as yours we regard as an absolute compliment.—EDITOR.)

ALTHOUGH A FLATTERING LETTER, WE PUBLISH IT

Editor, AMAZING STORIES:

I have just bought your November Issue of AMAZING STORIES. It is absolutely the best issue you have put out. The illustrations are excellent. Wesso being a second Paul. Another good one is Morey. The paper is fine, making a thin flexible magazine, and the cover is marvelous. I was somewhat disappointed with the September issue, but the two succeeding ones make up for it. The best story you have published recently is "Death to the Scarlet Peaks," by Hyatt Verrill. It was a masterpiece; give us more like it. Other good stories since the change of publishers are: "Burton's Island" and "The Microscopic Buccaneers," by Harl Vincent, "The Moon Strollers," by Ullrich, "Book of Worlds," by Dr. Breuer, "Futility" and "The Red Peril," by Capt. S. P. Meek, "Out of the Void," by Miss Leslie F. Stone, and, last but not least, Cyril G. Wates' great story, "Under the Ocean of Air." All of the stories in the QUARTERLY were good, but the illustrations were "awful," except those by Mackay and Hyrd. Give us more good stories, but none by Jules Verne or Wells. Be sure to keep your present good make-up of the magazine, especially the paper. I wish AMAZING STORIES a good future. Be sure to keep on and tell him not to be so modest, but to put his name on the excellent covers that he draws.

C. Mainfort,
6901 Ridgewood Avenue, Chevy Chase, Md.

(We are glad to note in reference to what you say in opening your letter, that you are by no mean the only one that has said AMAZING STORIES is imp oving. We suppose there is little doubt that our authors, our artists and our staff, are pleasing our public continually better and better. We have had considerable trouble in getting our artists to work up to our standards, but at last we have with us as good artists as we have ever had and we assure you that you will enjoy the art work always a little more. We shall probably not publish any reprints of stories by the authors you mention towards the close of your letter, for a long time. We certainly are going to keep up our good make-up of the paper and we highly appreciate your commendation.—EDITOR.)

SOME CURIOUS VIEWS ABOUT THE MOON—A SUGGESTION FOR A STORY

Editor, AMAZING STORIES:

I am writing to tell you that I think AMAZING STORIES is a unique magazine that would drive depression from anyone. The thoughtful reader finds there written and made real such a lot of the peculiar wonderings and thoughts of his introspective hours. I think your magazine, together with the QUARTERLY issues, gives more all-round satisfaction than quite a pile of any others that cater to the reading public.

In the editorial of one of your recent QUARTERLIES you ask for letters, so after much preparation I have decided to send you this one. It's rather an unusual communication, but I am writing to an unusual book, one wherein the stories *truly amaze* you.

Let me say first of all that nothing pleases me more than one of your interplanetary stories, like the "Ambassador from Mars," or an atom story, like that one about the Professor and his Cosmic Ray. I believe that there is a great future for these two types of stories. Not even crook or sex stories can beat them. There are such possibilities in an interplanetary story, for it tells of not another country but of another *world.* The field for atom stories, too, is "still in the mist."

First of all let me say that I do not think that man will ever reach the planets Mars. It's much too far away and the difficulties involved in a journey there render such an event impossible forever. Similarly the Martians, in the thin planet, would have to be such super-beings. I do, however, believe in the possibility at some future date of men flying to the moon and penetrating into on it, for "there are more things in heaven and earth" than men dream of, and *thousands* of miles of *earth* is conquered where *inches* cannot. Our best telescope brings the satellite within sixty miles of the earth. Could anyone sixty miles above *earth* in space tell much of our most intimate physical characteristics? When they build a telescope that brings us to within a mile above the moon's surface, we shall know whether it is a cold, dead world or not. I cannot conceive of millions of square miles of the surface of a world dead and deserted for ages of time. Perhaps as I continue, you will see that my letter is not so far fetched as it seems, tho' I bring no scientific calculations to support my theories.

I don't really believe that there is any such things as a "dark side" of the moon. I believe that when we are looking at the "face" of the full-moon, we are looking at one of its Polar Regions, possibly its South Pole. In early Autumn mornings we see the top half of our satellite's hemisphere illuminated like the top of an egg, by sunlight, and candlelight. Thus, I believe, is daylight on its Eastern half. In the evenings during certain phases and at certain times we see the lower half of the moon bright, which I believe would correspond to daylight in its Western half, according to my theory. I base my idea on the moon's rotation and the fact that the face of the "man" in some of its phases is nearly horizontal in both right and left positions. The moon seems to, during its periods of invisibility the "man's face" turns right over. I fancy that when we see "the old moon in the new moon's arms," (that is an obscure view of the whole rim at the time of the new moon) the thin bright rim that is visible is caused by the sunlight shining through its atmosphere. Further assertions to the contrary, I should place a very clear lunar atmosphere as existing at from one hundred to one hundred and fifty miles thick. I fancy that the moon gets considerable sun-

light all over it, and a bright light from the earth as well. You may treat this as science or just as you like, but I have explained my idea as clearly as I can.

Having got this far I would like to spin a little yarn, taking a step into the future. The dream episode may remind you of a scientifiction story, "The Voyage to Kemptonia," published a short time ago. The dreams were a *personal* experience occurring between 1923 and 1927. As a further note let me add that there is some relationship between selenium, and the moon. I believe that it is an *actual* Lunar metal, and then, let me mention two other things, though they are not, as far as I know, peculiar to the moon—borax, and the metal, uranium. Here is a scientifiction story in the rough, wherein a man asleep was marooned on a Dream Planet.

J. H. Longmore,
1,125 Ashted Terrace,
Ashted Row,
Birmingham, England.

(Your views about the moon will hardly bear examination. There is, properly speaking, no dark side to the moon, any more than to the earth. There is an unseen side, as far as we are concerned, and at full moon this becomes the dark side. At new moon the dark side is the one facing us. But we never see but the one side. The other is always turned away from us.—EDITOR.)

A LETTER OF VERY BREEZY CRITICISM

Editor, AMAZING STORIES:

It occurs to me that many of your readers might lend great value to their "Discussions" by stating just who and what they are. As an example, I am twenty-two, high school and business educated, aeroplane pilot by desire and some 160-hour flying and airplane and motor mechanic by trade. Having been a rather voracious reader and self-appointed critic of most of the scientific fiction magazines for some three years, it seems fitting that I should add my voice to the crying multitude again.

"Beyond the Green Print" seems a bit fantastic, like most of the "terrific" yarns, but this one bids fair to be very entertaining—as do most of his works.

"The Sword and the Atopen" is entirely out of my line, of course, but seems fairly interesting for a new man's work.

"When the Atoms Failed" was quite entertaining—but a wee bit *too* "hot" to suit your humble servant. Mr. Campbell, however, tells his yarn very well—and I wish he were to publish a sequel to it. His figures are "most amazin' big," but *please* tell him to quit measuring in thimbleful to mike them so! Gee, old timer, you wouldn't measure the solar system in centimeters would you? Savvy?

Dr. Breuer's "Hungry Guinea Pig" rather bored me, as do most of his stories. This, I believe, is only a matter of taste—for the doctor recently does quite well with auto-and does well with the subjects he chooses.

"Air Lines," by Dr. Keller, is in my line. I enjoyed his story very much indeed, and it appears to view present relations of the sexes with the same apprehension that I do. It may interest him to know that a "set-up" for the control of a plane in flight is on the market at this time, or rather, is being developed for the Sperry Gyroscope Co. by Sperry. This device, under actual test, has been proven to fly a plane on a given course more accurately than a human pilot. The plane must, of course, be along, but has his time free for attention to navigation or whatever else may be needed. Sorry to say, however, that regulation of the distance a robot would fly by regulation of the fuel supply is impossible. Not to mention changes in wind and weather, the variation of the rate of fuel and uneven consumption by the motor would make a difference of many, many miles in such a flight as is described, also, speed-or power required to maintain a certain speed, rather, and fuel consumption per mile will vary with the load carried. Next time, why not station someone to land the plane, by remote control through the radio beam and the robot. That, I believe, will come for freighters—though I don't think passengers will ever trust themselves to a pilotless plane.

It is interesting to say, by the way, that the Sperry Robot-pilot mentioned above, op-

(*Continued on page* 1189)

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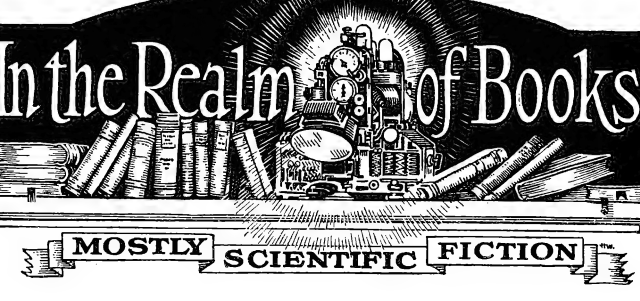

Looking Into the Future

"The Squareheads," a story of a Socialized State, by William Salisbury. Published by Independent Publishing Company, New Rochelle, New York, 1929. $1.00.

THIS book is a romance, the action of which is laid in the far future, when everything and everybody has been thoroughly standardized to the *nth* degree. The Philistines, the hypocrites and *hoi polloi, alias* voting cattle, "Stimmvieh" as the Germans so well express it, against whom this book is directed, will dislike it immensely—provided, of course, that they read it.

"The Squareheads" shows the dire results of paternalism in Government and the ever increasing power of the leagues and associations for minding everybody else's business. Mr. Salisbury does not, of course, mention the United States outright, but only a dull mind would miss the inference.

The story runs somewhat as follows: An aviator crashes and remains uninjured, except that he falls into a state of suspended animation from which he "revives" hundreds of years later, at which time he discovers himself to be a "freak" in a metropolis of beings, who have apparently evolved into men and women with square heads, square noses, square ears, square lips—in fact, a veritable harmony of bodily squareness and "cubeness." Their clothing is naturally checkered to fit in with their square anatomies. They are ideal citizens, completely standardized in thought and action. They think only official thoughts, read only officially approved books and see only officially approved plays and movies. The only outstanding Anglo - Saxon characteristic — sniffling, praying, sanctimonious hypocrisy—is retained in the Squarehead State in its full power of glory. They still drink behind closed doors in speakeasies; bootleggers are everywhere and the official corruption is enormous.

Salisbury describes the squarehead jails as "Service Institutions." It certainly would sound better to their sensitive ears to hear that Mr. A of the Aridity League spent a year or so in a "Service Institution" than to hear the blunt statement that he went to jail for a year.

It seems to me that Mr. Salisbury missed one good point; he should have written a national hymn for the Squarehead State to be sung on all possible occasions.

Mr. W. Adolphe Roberts, in his introduction to this book, waxes exceedingly enthusiastic over the brilliant satire of this work. Most of it, however, is so very obvious, it misses the point of brilliance. However, those who enjoy reading satirical works will enjoy "The Squareheads" and the author's ideas on what this world is coming to—C. A. B.

By One of Our Authors

"The Planet of Peril," by Otis Adelbert Kline. Published by A. C. McClurg & Company, Chicago. 1929. $2.00.

IF the authors of interplanetary tales are capable of overcoming their first big problem in a convincing manner, half their battle is won and the rest is easy. This problem is none other than the transportation of the hero to other planets. There are divers methods of doing this. Mr. Kline uses a sort of psychic transference to get Robert Grandon to beautiful and mysterious Venus. Grandon, who has craved adventure on Earth, is persuaded by a Dr. Morgan, who has established psychic contact with certain intellects on Venus, to exchange his personality with one of the inhabitants of Venus.

Grandon wakes up in the body of Prince Thavdlor, a captive slave in the quarries of Princess Vernia, and makes his escape, assisted by one Vorn Vangal, Dr. Morgan's scientific aid on Venus. After many exciting adventures as Grandon of Terra, he becomes chief commander of an army fighting against Princess Vernia's force. Grandon's army is defeated, and while fleeing he rescues his enemy, the Princess Vernia. Together, they have the most exciting adventures, fighting with gigantic reptiles, harpy-like vampire bats, etc., but are finally captured by super-intelligent giant ants, the sabids. More adventures follow, of course, until Grandon, single-handed, effects a single-handed rescue and is finely reunited with Vernia and proclaimed Emperor.

"The Planet of Peril" is an exceedingly well-spun yarn and can heartily be recommended to all our readers, and to all lovers of imagination-stirring fiction. It is a truly amazing story—C. A. B.

Finishing a Trilogy

"The Man Who Mastered Time," by Ray Cummings. Published by A. C. McClurg & Company, Chicago, 1929. $2.00.

ONCE more we find old friends, which we first met in "The Girl in the Golden Atom," the first of a trilogy, by Ray Cummings. "The Man Who Mastered Time," is the last of this series of stories dealing with matter, space and time.

Loto Rogers is the son of an American chemist, but he was born in the infinitesimal world of the Golden Atom. His mother, Lylda, was a native of this atomic world and his maternal grandfather was the greatest scientist of this race. This is not mentioned in the book, but these facts explain the tremendous genius of Loto Rogers being a heritage, not only from his father, but from the strange people of his mother's race.

Loto and his father discover that time, like space, may be traversed. They demonstrate to the Scientific Club, of New York, their machine built somewhat like an airplane, and to prove their assertions, Loto sets out on a "time" voyage, spurred on by the hope of rescuing a maiden, whom he has glimpsed in the future, where she was held captive in a desolate region. It is truly a magic journey. Hundreds of years of time are traversed in a few minutes. With speed advanced, he sees magnificent cities grow up and crumble to dust, and when he finally stops the machine, he has traveled about 50,000 years into the future. But what a future! Humanity is living under very primitive conditions, somewhat like the dark ages. The common people, the Bas, are revolting against their rulers, the Arans, who are continuously holding orgies of the most sensual kind. Loto takes part in the revolution, frees the captive girl and carries her back with him to 1929. Of course, they get married.

Compared to another well-known "time" story, "The Time Machine," by Wells, "The Man Who Mastered Time" seems to me to be more ingenious in its conception, more full of action and more plausible. It is excellent reading.—C. A. B.

"The Mysterious Island," by Jules Verne, recently produced on the screen will be reviewed in the April issue.

erates from two gyroscopes, in a manner similar to the one described by Dr. Keller. On the whole, I'd call it a plenty fine job—particularly since it's a bit out of Dr. Keller's line.

"The First Ornithopter" sounded pretty good—though I must admit that I have no faith in at that sort of flier. Too many complicated movements—hence too hard to control. Several tries have been made along that line—but I've never heard of one getting off. I'll stick to propellers 'till the rocket comes into its own—thanks.

With due respect to Mr. Skinner, I simply can't feature his "Corpse That Lived." His irony seems forced, to me, and I'd call his plot—in plain American—"darn weak." It doesn't say his next won't be good, though. We all slip now and then and anyhow, it's probably more my taste than his work that's at fault. Hope we can get on better next time.

Mr. Kendig's "Fourth Dimensional Space Penetrator" struck me as a real tale. This is, perhaps, because he did show me, in everyday English, a fourth dimension as mathematically correct as the famous two and two! My first reaction was to wonder why in thunder I hadn't thought of that language. Also, he did not try to bend, twist, warp or otherwise maltreat the "space" for which scientifiction is teaching me a most profound respect! He sounds like "there" to me!

On the whole, I believe your magazine is keeping well up with others in its class—I know of none better—and I know of some decidedly worse! I have all past issues, monthly and quarterly both—and propose to have all those of the future.

My big suggestion would be to print your serials in *book form*, as cheaply as possible, and announce them opposite your table of contents, leaving the magazine for complete stories, or, publish a series of them—one per month, issued as magazines—one or two to the issue. For others with the same aversion I have to losing the thread of a story in these days of daily life, I've worked my own system—lay aside the first instalment, unread, until you have the story complete. This, obviously, has its drawbacks, though. I usually get destitute for something worth reading—and haven't the will-power to leave 'em alone that long.

E. G. Guding,
Dallas, Texas.

(This letter certainly speaks for itself in no uncertain terms. It is breezy as we state at its head. Dr. Breuer is a highly accomplished practitioner of the healing art, and his work shows a most scientific knowledge, without obscuration of the story element. We can only say about continued stories that your idea is fine. Your suggestion of how to treat them gives a good and well-known method for the impatiently minded.—EDITOR.)

A VERY PLEASANT APPRECIATION OF THE MAGAZINE

Editor, AMAZING STORIES:

I have read your magazine for a number of months and have yet to be disappointed. I flatter myself that I appreciate another's viewpoint. I have noticed that requests by readers do not all run on a general line or pattern, but instead there are a great number of opposites. This is a good thing; it shows interest in your magazine.

What I am stating is of no probable interest to you, as you receive many such letters. You will realize and appreciate my position more, because the discussions column of the October issue is the first I ever read.

You have an interesting variety of stories unobtainable in any other magaine. It is impossible to please everybody, but you come the nearest.

In reconsidering you I am not basing my criticism. I also admire your exceedingly tactful way of answering critics' letters. I hope you will excuse my small vocabulary, poor writing, pencil and paper as it is too late to resort to ink or paper in ink.

Edgar W. Cook,
20 Tremont Place, Mattapan, Mass.

(We sometimes think that we should hardly publish such flattering letters as yours, because it seems too much like self-satisfaction, but we find ample justification in doing so by the many scolding letters which we receive. You make a good point when you say these letters show interest in our magazine. We are sure you will enjoy the regular perusal of the discussions columns. Thank you for your letter.—EDITOR.)

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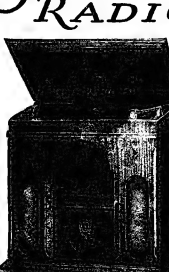

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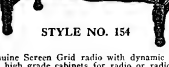

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AN INTERESTING LETTER FROM ENGLAND

Editor, AMAZING STORIES:

Please may I contradict? . . . Thank you.

First of all I should like to appeal to those who write to the Discussions department to discuss scientific or fiction matters exclusively and not just write how they began to read AMAZING STORIES or how good it is. We all like it. If we did not, we would not read it. . . . That's that.

Mr. Jos. E. Vincent, I am sure, has not studied the matter of atomic structure and metaphysics. Together with the theory of planetary atoms is the one of the non-material nature of the electrons. The proton seems to have practically the whole mass of the atom, but I or we, that is—our solar system—is an atom of a higher universe and need not necessarily be material in our sense of the word. In these conditions the sun might have practically the whole of the solar system's mass, or what would correspond to mass (in fact, it nearly has), and the planets might have "identical masses." The quantum theory is only a theory based on matter as we know it. The electrons might, then, consist of something which would be equivalent to matter, electrical attraction replacing gravity.

Again Mr. Vincent says that mass is of the third degree. This, of course, is wrong. He mistakes dimension with degree. If length is of first degree, and velocity $\left(\frac{\text{time}}{\text{length}}\right)$ of 0 degree then acceleration $\left(\frac{\text{length}}{\text{time} \times \text{time}}\right)$ would be of -1 degree. This is absurd.

I should like to point out the effect upon a man traveling with an acceleration per second equal to the velocity of light. (The Skylark of Space.) Let us assume first that it means 186,000 miles per second and that his weight is 10 stone (140 lbs. is my way of weighing) this acceleration would make him assume the weight of 1,432,200,000 pounds; I could turn this into tons but it would not look so nice.

I'll tell Mr. Pedley—a fellow countryman of mine—something worth knowing. I admire America, and Americans, because of the modernity of its cities, but he must remember that although the skyscrapers be many its soil is of clay and they would be dangerous. I will also tell this gentleman that if he were a real Englishman he would not say that all the commodities are American—it is unfair both to you and to us. America (U. S. A.) is a bigger, newer country; every one in it has a spirit of "going-to-do-something;" here it is rather "I may do something," because there is not enough work—and this is because the spirit of England is getting old. However, if every one was as ambitious as I am, we would give you a jolly fine fight in the way of modernisms.

I quite agree with Mr. Donald Tearle about the "sameness" of interplanetary travel. I have a brand-new non-patented idea on this. It will not work but it might have done. The idea is this: If you have two equal weights, A and B, connected by a string over two pulleys, and one of them is made to swing, the centrifugal force acting downwards will cause that one to increase apparently. By having the weight vibrating with its centre of curvature beneath, it would lose its weight completely if it went sufficiently fast. Now then, A shadows are three dimensional; they extend from the solid body causing them to the surface stopping them. A shadow is not a thing; it is the absence of light. It still retains its existence, even if there is no wall to show the contrast between lighted and shaded portions. How many dimensions has a vacuum—usually, it is the absence of air.

R. A. Eades,
21 Earls Court Sq.,
London S. W. 5,
England.

(The writer particularly enjoys your letter. A number of years ago it was his good fortune to be in London with his automobile in a mews in back of the hotel, and he certainly did enjoy your delightful city, which he had visited long before automobile or motor cars were extant. Your letter is most interesting and we leave it to Mr. Vincent or Mr. Pedley to answer. Your suggestion that the sun in its proportional mass represents the proton of an atom is very ingenious. Interplanetary stories, you must remember, must inevitably

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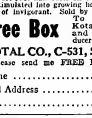

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be pretty "stiff" as regards acceleration, but if we want to have interstellar tales, we must reconcile ourselves to using that impossible acceleration. It is true that a shadow is not a thing but if two-dimensional objects could be conceived of, they certainly would not be things, for they would have no substance any more than a shadow.—EDITOR.)

AN APPRECIATION OF OUR ARTISTS AND STORIES

Editor, AMAZING STORIES:

AMAZING STORIES is getting better. Good illustrations by Wesso and Morey, more pages, better paper and better stories are making it so.

It is hard to decide which the best story was in the December issue, but I decided on "Vampires of the Desert," "A Baby on Neptune" and "The Time Deflector" were the three best. The latter story is impossible, though we may sometimes be able to catch the light rays and get a moving picture of the past as in "The Time Eliminator" which appeared in the September issue, by issue of AMAZING STORIES, but it will not be possible to see into the future as it "hasn't happened" yet.

Many readers have asked for reprints. I would like to see the following appear in both the QUARTERLY and MONTHLY: "Tarrano the Conqueror," "The Ghost Girl of Callisto," "The Man from Golden Atom," by Ray Cummings. Please use Paul's original picture from SCIENCE & INVENTION.

I hope to see sequels to "The Sea Girl of Space," "The Face in the Abyss" and "The Moon Pool" very soon.

Jack Darrow,
4225 N. Spaulding Ave., Chicago, Illinois.

(Of course we publish what seem to be impossible stories, and we give as frequently found fault with. It is quite impossible for the editors of AMAZING STORIES to escape criticism and to please everybody, because the tastes of our readers differ so greatly.—EDITOR.)

ARE WE, OR AREN'T WE?

Editor, AMAZING STORIES:

So—ay, what's become of "our" magazine? One month it's the same as usual, the next is almost unrecognizable. Is the publisher crazy? What has become of the peerless artist, Paul? Has your rival appropriated his services altogether? Editor, take a tip from a long-time reader, and one who wishes for your best success, and discard your present staff of artists. Most of them, anyway. I haven't the slightest objection to your cover artist at all. He is simply fine. His illustration for "The Steam God" is a great deal better than the story itself, right! They are simply frightful. Take for instance, this illustration for Part I of "The Secret Kingdom." I thought "our magazine" was supposed to be a serious magazine. Anyone glancing haphazardly through the October issue and happening upon the principal illustration of "The Secret Kingdom" would instantly receive the impression that they were looking at a child's magazine, a "Mother Goose" book. Anyone may not think that the type of illustration of which we have complain to do with the readability of it, but they do, I know! For I came within an ace of throwing away my copy of the October issue when I had glimpsed the drawings that ruined it. In the above mentioned issue, with the exception of the cover, there wasn't one "honest to goodness" scientific drawing such as graced your magazine in the past. Briggs is pretty good—the best of your present staff in fact—but he is not Paul, by a long pace we'll say. If it is possible to get Paul back, you or "we" (the readers) will never regret it, and you will have the heartfelt thanks of *every* reader of A. S. If you can't get him back, for goodness sakes get somebody who can draw.

My complaint is only against the illustrations. The paper, binding, cover, stories, etc., are more than satisfactory. Not wait, there is *one* more item about which to complain, with your permission, of course—that is about the paragraph in which the editor gave the reader some idea about the story. In former times, this paragraph was affixed in the center of the first page of the story. But, with the change of editors, this also was changed. Won't you please put it back where it belongs. It makes the magazine look so much more dignified, and it also distinguishes it from the common run of magazines.

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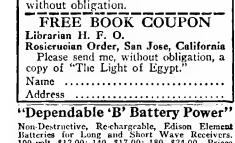

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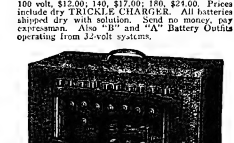

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I have no comments to make on the stories, as they are all fine, though the story "The Steam God" did strike me as being rather dull (at times).

Fred Miller,
R. F. D. No. 4, Grenville, S. C.

(Your letter, we are sorry to say, has been delayed in the publication. We have had considerable trouble about our artists, but now we have several of as high-grade as Paul; we find them particularly good in figures, and by the time you see this issue you will probably be in complete accord with the statement made by other readers, that Wesso and Morey both are working out beautifully in giving real "scientifiction" illustrations besides giving us real art-work also. Bob Dean is definitely a comic artist, and a very good one—but that had to be found out by experience. We are giving the names of artists, who illustrate the stories, so you can criticize them more easily. We have had so many letters, commenting on the improvement since last fall in AMAZING STORIES, that we feel duty bound to continue the uphill grind of improvement. It is no easy task. Such letters as yours are always welcome, for criticism helps us in our efforts.—EDITOR.)

THE ALLEGED BLUE COLORS AROUND A WHIRLING PROPELLER—INTERPLANETARY THOUGHT COMMUNICATION—THE FOURTH DIMENSION

Editor, AMAZING STORIES:

. have just finished reading the January number of AMAZING STORIES. Although I have been reading this magazine off and on ever since it started, I have never noticed such a good collection of stories in one month before. John W. Campbell is certainly an exceptional writer. Let's have some more stories like "The First Ornithopter."

In the December issue "Baby on Neptune" is wonderfully well written and conceived. "The Colloidal Nemesis" is another good story. "The Time Deflector" begins well but rather falls through later on. The scientific part of it seems to be an excuse to put a commonplace view of the future into a magazine of "scientifiction." I fail to see any amount of science connected with "The Secret Kingdom," although I admit it to be a tale of rare interest.

I notice that in many stories a method of thought communication is used between people of different ages. It has occurred to me, however, that this method might not always work—for do not people of different tongues think differently, and, if the tongues were greatly different might not also be the modes of thinking?

In reading the "Discussions" Column, I saw that J. G. Strong wonders why Garrett P. Serviss has ceased writing. Since it is worth mentioning, I take this opportunity to say that he died when at the age of 75. Clyde F. Beck asks why a deep blue color appears in the vicinity of a whirling propeller. I have thought of this myself and in answer to his query. Please tell me if I am correct. On a dull gray day the pressure is low, but on a clear day the pressure is high, and the sky is blue. The quantity of air near a propeller is small, and, therefore, no color is visible when the propeller is motionless. However, when the propeller is spinning fast, a pressure is created in the atmosphere behind it. This air, which is under a greater pressure, assumes a blue color for the same reason that the sky appears blue on clear days—that is, when a high atmospheric pressure exists. C. Watson, in explaining his views of the fourth dimension, says that it is necessary to have all three and a fourth, namely, time, in order to locate an object in space. This may be true, but consider: dimensions are also necessary for construction—how could a drawing show a dimension of an object to be built (sometimes it might determine the style or limit the material, but it leaves room for variation).

I am sorry to have taken up so much room, but this is my first communication to your magazine, and I had so much to say. Maybe you will have to print it in installments.

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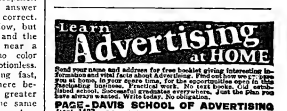

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(We are sure that Mr. Campbell will be greatly pleased when he reads this letter. He has done remarkable work for us and is going to do a great deal more. Besides his own knowledge of the higher branches of science, he is associated with men to whom he can apply for confirmation of his views, so that his stories are entitled to be considered quite authoritative. To carry out many of our stories, some system of communication between beings of different planets has to be assumed, so our authors adopt something like telepathy. This takes care of the question, but we cannot see that you are at all justified in thinking that people of different tongues think differently. It is not easy to see how language should influence thought. Your view about the color of air varying with its pressure, we are disinclined to accept. Before expressing any opinion about the blue color our correspondent speaks of, we would wish to see it. Seeing is believing and believing is often the first step to explaining. Your letter is not a bit too long. Our Discussions Columns are the property of our correspondents and we are more than pleased to get such letters as yours.—Editor.)

TIME-TRAVEL STORIES CRITICIZED DISSENTINGLY

Editor, AMAZING STORIES:

Time-traveling stories have always interested me because of their very impossibility. When anyone can write a good story about an impossibility, it always makes interesting reading. Why? Well, chiefly because of these "impossibilities" which later come true, in real life.

I have always been for the under dog in a fight, and it seems to me as though impossibilities are becoming the under dog in the "fight" waged between your critics in "Discussions." However, that is why I am not here to champion an impossibility, but to show up a lamentable fallacy in the plot of "The Time-Deflector," by Harl Vincent, which, in the December issue of AMAZING STORIES, and it is by using Professor Melville's own method of reasoning that I propose to do it.

According to Professor Melville, no change can be made in the past, but a change can be made in the future. Very well, we shall see how true this statement holds. Mr. Rementer has a man (John Woodland) emerge from the past of the year 1925 A. D., and, and therefore his appearance before these people of the future is to them a resurrection from the tomb. And such an occurrence really took place in 1925 A. D., it would quite likely have been of sufficient importance to go down in history, and if so, the people of 6050 A. D. looked for some result or other, strange to say, and consequently the people are in ignorance of Woodland's coming. Now, what is the result—when he suddenly appeared in their midst. I, too, would have been greatly surprised to receive as a visitor one whose bones had long since mouldered into dust, and I believe this to be the proper attitude to adopt in a case of this sort.

The only way that I can regard or conceive of this being possible, is that a very brief portion of Woodland's life was held over (in the fourth dimension) for a space of 5,000 years, and that he lived that portion in the year 6050 A. D. Therefore, only that minute fraction of his life could have been held over, inasmuch as he lived the remainder of it in the twentieth century. I believe that this is the only possible explanation of the situation which will hold good. If this does not hold true, then just try and find one which will.

Strange things do occur, but discredited or confirmed Professor Melville's belief that his little experiment was a big success? I am not quite certain, but I think it has made it quite clear that Mr. Woodland's behavior was very strange—very strange indeed, and that he did not act at all in accord with our preconceived notions concerning the conduct of a deceased person.

That is all, gentlemen. I wish to state that Mr. Rementer's conception of the future is somewhat at variance with mine.

C. H. Osborne,
17 North Fifth St., Fulton, N. Y.

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(The first clause of this letter is most interesting. Our readers know that we want "our" magazine to be unique. Its science is watched carefully. Much is allowed to go in which seems far-fetched, but in view of the kaleidoscopic changes which are occurring in science, we feel justified in letting our writers use their imaginations in the most active way and this first clause of your letter, to which we refer, shows that you are with us in this idea. We agree with you in the next clauses of your letter about past time and future time. We are also glad whenever one of our stories finds such interesting criticism as yours.—Editor.)

BRICKBATS FOR ARTISTS

Editor, AMAZING STORIES:

I have just finished your October number, and the stories were great, especially the "Steam God," and "The Chamber of Life"—but although I have helped to nurse AMAZING STORIES up from its infancy by reading it steadily, I never, in all my literary career, found such startling, incongruous illustrations. In this class of periodicals I consider this my favorite magazine. The cover was good and the attendant pictures of the "Steam God" were cleverly and artistically executed—but, words are inadequate to even attempt to describe the rest—the ones intended to portray incidents in the splendid novel, "Death from the Skies," are such that I'm afraid they wouldn't justify a six-year-old child's attempts at art. One is a perfect nightmare, a phantasma of a great deal of something, but definitely nothing! And—whoever in this world or any other ever saw a wave as depicted on page 590? It's a bit too much for even a "gullible" public to swallow!

Until recently the illustrations were all that could be desired, and though I am an inveterate reader of "Extravagant Fiction," I prefer illustrations that illustrate, and not the type that cause one to hide the magazine under a bushel when the boss comes in.

My criticisms are quite flowery—but the wild phantasmagoria thrust on "we public" this time, I feel justifies criticism.

Ray E. Warner, Jr., 1st Engineer,
Island Light & Power Co.,
Block Island, R. I.

(We are sorry that our illustrations do not please you. It happens that we have had a great reorganization to go through and whatever our failings may have been, we feel that we have done pretty well to pull out as well as we have, and to have secured what we definitely consider an excellent staff of artists. We are sure that you will find hereafter that our illustrations are superior in many ways to any that have appeared on our pages before. The great difficulty in old times was to get good figures in our pictures. It was a real matter of surprise to us that so few of our critics seem to have seen the defects in the character depiction by our artists. That is definitely overcome. Our staff has been selected, and we now have some excellent artists. We are open to criticism. We expect it and we welcome it, even if unfavorable, provided there is a good basis for it. Such criticism is useful and we want it even if it is not pleasant, but we know that our art work is now improving and we should like to hear from you again.—Editor.)

AMAZING STORIES ON SHIPBOARD

Editor, AMAZING STORIES:

Just a brief note, to tell you that your stories are doing wonders aboard my ship. At first, no one would consider reading them, 'til I left them lying around where they could be seen. Now I have to hide my new issues if I want to read them first. Many arguments come up, between the men and myself, but I always seem to come out on top. I have various science books of my own at hand, to prove my points or to prove them in error. It is interesting, the different points that are brought up, by some of the younger men. When I find time, I shall jot down some of the more interesting arguments. 'Til then, more psychological stories, please.

W. J. Shaw,
U. S. S. Utah, Box B.

(The writer of the above letter is not the only navy man who has communicated with us, and we are pleased that our stories seem to appeal to sailors. We are very glad indeed to give space to letters from Uncle Sam's boys.—EDITOR.)

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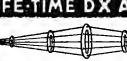

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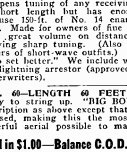

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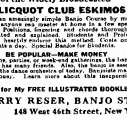

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INTERPLANETARY TRAVEL AND SPACE
Editor, AMAZING STORIES:

I have read many interplanetary travel stories and enjoy them. That authors now inject science that makes them the more plausible and interesting. I am the last to pick flaws in their methods. Let the author write his own story. Primarily, we read fiction because it entertains or interests us. If we do not like a story we need not read it. Personally, the so-called "different stories" appeal to me.

History shows that in the past many a wild tale has been a prophetic one. Tales have been written of flying airboats, submarine travels, projected pictures, voices, invisible rays, in the days of practical witchcraft. These are now accepted as a matter of course. Who knows what germ of future truth lies in the scientific stories of today, an unrecognized prophecy?

However, if the scientists and astronomists are correct, interplanetary travel can never be accomplished by the physical body, or mechanical inventions. They tell us that beyond the shell surrounding earth, vast space, incomputable in light years, is a seething mass of stardust, atoms, fragments of worlds—worlds—and worlds, suns—stars, exploding and burning worlds. It might be likened to a vast flowing ocean of fluid lava in which spin the planetary bodies and fragments, forming new worlds, perhaps, as our own may have been formed, and alas, destroying old worlds.

Before telescopes came, earth people believed only the sun, moon and visible stars existed, but as stronger lenses developed, it was to learn that beyond these, were millions more, greater than our familiar heavenly bodies, and beyond these, still more millions, and so on *ad infinitum*.

They tell us, if it were not for this shell surrounding earth, our planet would be instantly destroyed by the rain of bodies, stars, comets, traveling at lightning speed to earth's attraction. At times the shell is penetrated, so scientists explain the meteors and the "Rain of Stars," which fell many years ago.

If distance and motive power could be overcome, once leaving the protecting shell, the vehicle would be completely demolished.

It is interesting to speculate on the possibilities of messages through the medium of rays or waves. Will it ever be accomplished? At present, these two agencies are limited to machinery at both ends, but we are only half acquainted with them as yet. New invisible rays and waves have been discovered, but seemingly, we are as yet in the dark as to what uses may be made of them. Too much effort is being spent on discovering or rather, uncovering destructive rays, death-dealing rays, for use in wars—and too little effort is better be expended in developing constructive ones.

Knowing as we do, that all these greater than earth worlds, with their own surrounding planetary systems, exist, is it not somewhat absurd for man to imagine that his is the only inhabited world? Meteors and meteorites examinations have proved to consist of exactly the same elements as are found on the earth. Is that not significant?

Another unsolved riddle, is man thought travel on waves? What is mental telepathy? Is it accomplished because thought can, or does travel on waves or rays? Few, today, would attempt to deny mental telepathy, but no one really explains it. Is it another unknown wave, waiting in the dark for science to uncover, a means of more perfect communication, a path-finder perhaps, to other worlds? Who can tell?

Marie La France,
335 14th St., Portland, Ore.

(Personally, we feel that interplanetary travel will never be attained by man. It's hardly fair, we think, to call such a subject something the earth. It is enveloped in its own atmosphere which gradually becomes rarer, so that after a very limited number of miles, there is nothing but a practical vacuum. The space outside the earth's atmosphere is not a seething mass, such as you describe. It really is almost a complete vacuum and the planets and stars and asteroids occupy an astonishingly small proportion of this space. So you should abandon your idea of space being full of solid bodies, for it is not so. We entirely agree with your view about the perfecting of constructive rays rather than of destructive ones. But it seems as if mankind in its stupidity would always incline toward war. One of the views about the world of the stars is that practically all of them are hot, some many times hotter than the sun, so that it is hard to pick out any star or any planet which would support the life of beings at all like ourselves. The more one reads about the mysteries of the stars, which is after all *THE* Universe, the more strange it appears as a waste of material.

If scientific travel could be proved or demonstrated, we might attempt to explain it.—EDITOR.)

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"IMPROBABLE PROBABLE" STORIES ARE ASKED FOR BY AN ADMIRER OF ONE OF OUR AUTHORS

Editor, AMAZING STORIES:

I am an enthusiastic reader of your magazine, I believe that it improves with each issue.

As every reader finds some author or who appeals particularly to him, I am wondering why you do not have more of those short stories by W. Alexander.

The operations of his Doctor are so plausible that they almost seem true, in fact I remember a story of his which appeared in your magazine some time ago about an exchange of brains. Recently I read in the July "Readers Digest" of a successful operation performed by Dr. Alexis Carrel (Nobel Prize winner), in which he exchanged the hearts of two dogs.

Your magazine is interesting from cover to cover, but let's have more "improbable probable" stories.

Winifred Harrison,
929 D Ave., Coronado, Calif.

(The advances in medicine are characterized by several features. One is the doing away with secrecy and mystery. The old-time family doctor sometimes quite seriously objected to his patients or their family trying to read his obscurely written prescriptions. Now the advanced physician has nothing to conceal, he has no mystery, and is willing to talk over his cases with those interested or capable of understanding him, always with the strictest regard to the confidential nature of his duties. Another feature is the mechanical aid that is sometimes called "common sense." When it was discovered that a disease was due to excess of sugar in the system the scientific engineering sensible and mechanical in a degree, to use a scrum to reduce it. This refers to insulin which has rescued many a patient from a life of suffering to one of practically normal health. The development of surgery has directly introduced mechanics into the profession, for the repair of a broken bone, while it is done entirely by surgeons, is made mechanically good by the surgeon. Now the healing professions with local anaesthesia and the constant developments, which are coming on with ever increasing succession, are doing what we may describe in your words as the "improbable probable." We would rather have our stories verge on the improbable and lead to development in the future, than to have them aridly matter of fact.—EDITOR.)

TWO DIMENSIONAL OBJECTS, HOW LONG SHOULD STORIES BE?

Editor, AMAZING STORIES:

In looking over your October issue of AMAZING STORIES MONTHLY, I happened to read a letter from a Mr. Miller of New York, who states quite emphatically that a shadow cannot be two dimensional. I wish just as emphatically to disagree with him.

A shadow is caused by some object, presumably three dimensional, obstructing rays of light from some luminous body, thus causing a portion of the surface on which the rays would otherwise fall, to be made darker, due to the partial absence of those rays.

Now, if we could see light, undoubtedly a shadow would have thickness, but it is a well-known physical phenomenon that light is invisible until reflected from some object. A reflecting surface is obviously two-dimensional. Thus, since a shadow is merely a lesser reflection, due to the obstruction of light on a reflecting surface, it is also two-dimensional. I could go on like this for hours.

Now, may I tell my preferences?

I liked, in this issue, Dr. Fisher's Mertenhaker's story, "The Chamber of Life," although I cannot see why he called the dream-inducing machine that. It was a hypnotizer, if two-dimensional. This, since a shadow is merely a lesser reflection, due to the obstruction of light on a reflecting surface, it is also two-dimensional. I could go on like this for hours.

Now, may I tell my preferences?

I liked, in this issue, Dr. Fisher's Mertenhaker's story, "The Chamber of Life," although I cannot see why he called the dream-inducing machine that. It was a hypnotizer, if two-dimensional. At his best. The language used, unlike that of a wearying number of your stories, was concise and clear. When the author got to the end of his narrative, he resisted the impulse to go on with three or four more chapters, and stopped; for that I like him too.

The other stories in the October issue were all fair, but rather verbose. "Death from the Skies," for instance, could have been made much shorter.

Now that I have thrown my brickbats, let me also toss a few bouquets. The best story of the type I ever read was "The Moon Pool," which ran serially in your magazine a year or so ago. It had all the elements of a best seller. The characterization was perfect, scientific data was plentiful, but not wearying, and the wording was such as to convey a real thought. Also, "The Feline Light and Power Company, Incorporated," struck me as a very funny story.

Wm. H. Fisher,
909 Virginia St., Antigo, Wis.

(What we may term the "two dimension" subject and the "four-dimension" subject have occasioned much discussion among our readers. To imagine a two-dimension object brings us up against the infinitely small, and it is there that the puzzle occurs. Of course, a strictly two-dimension object would be no object at all, so that we can only uncrive of it, but it involves a contradiction. Much the same can be said about the fourth dimension. You are one of many people who admired the "Moon Pool." Writer sometimes thinks that he has a troublesome sense of humor, so he is very glad to find you expressing your approval of one of the humorous stories which we have published. Some of them certainly were very amusing and of good scientific quality. You speak of stories being verbose. It is a recognized fact that condensed narration is not good style—style in writing is one of the principal points to be attained and is destroyed by too much brevity.—EDITOR.)

A CRITICISM FROM A KENTISHMAN; THE VIEWS OF AN ENGLISH READER

Editor, AMAZING STORIES:

About 50 per cent. of your discussion columns seem to be occupied with the vexed question of the cover. This is quite unnecessary, since both parties could be satisfied by the following arrangement, which can be made at little or no extra expense:

Inside the ordinary cover include an extra page, made in dark brown or imitation crocodile with your cover on it. Then those people who don't like the ordinary cover, can tear it off, and leave a tasteful binding underneath, while those who do, can leave it on.

In criticism of your magazine, which I buy at four pence a time from second-hand bookstores in London, the only fault I can find is that your serial stories are occasionally "stale." No doubt this saves you expense in not having to pay writers to produce a new one, nevertheless, readers who have already read the story are being deprived of some of the pleasure to which they are entitled through the purchase of the magazine.

Otherwise, I have nothing but praise for your paper.

F. E. Perry,
Kings Avenue, Bromley, Kent.

(We have received a number of requests from readers for reprints. Those that we have given were often protected and cost us more than original ones. It is now six months since we published a reprint. Your idea of a double cover is a very practical, and as we have a name that suggests amazement, should not our covers be as amazing as what appears between them?—EDITOR.)

THE VANGUARD OF VENUS

Editor, AMAZING STORIES:

I am a regular reader of AMAZING STORIES and think that it is one of the best magazines published, because the stories are of an entirely different nature than stories usually found in most magazines. However, I wished to ask some questions in regard to the story "The Vanguard of Venus," and would greatly appreciate any knowledge that you might possess which would aid in making the story clearer to me. Was the so-called "story" actually written by the man, Stanley Murdock, and if so, why does the booklet have printed on the front page "The Vanguard of Venus," by Landell Bartlett? Remembering the advertisement in your magazine, there was a statement made that this story would never be published. I was wondering, after I had finished the story, whether it was the wish of those who put it in, to publish it as a true story, and is the contents of the letter published on the first page authentic, and if so, could you give me a little enlightenment upon the subject? I took heed of the warning on top of page 4, that the document should be taken as fictitious so as to prevent uneasiness among the credulous. Still there is something unusual about the whole thing, and I am not inclined to be so skeptical about it. There is a tone of sympathy all through the document and its author seems to be in a predicament—where but few tread. This constitutes the chief reason why I am writing. Anything which would enlighten me upon the subject would be greatly appreciated.

Dana B. Houston,
320-3 Sixth Ave.

("The Vanguard of Venus" was written by Landell Bartlett. Everything in it is pure fiction; the name Stanley Murdock is part of the fiction.—EDITOR.)

"Don't spoil the party"

someone called when I sat down at the piano

—a moment later they got the surprise of their lives!

"I TELL seem like old times to have Dan with us again."

"You'd better lock the piano!" came the laughing rejoiner.

How well I knew what they were talking about. At the last party I had attended I had sat down at the piano and in my usual "chop-stick" fashion started playing.

Before long, however, I turned around and—*the room was empty!*

Burning with shame, I determined to turn the tables. Tonight my moment had come.

Turning to Bill, I said, "Hope you've had the piano tuned."

For a moment no one spoke. Then someone called: "For heaven's sake, *don't spoil the party!*"

I Fool My Friends

That was my cue. Instead of replying I sat down at the piano and started the first bars of "Sunbeam."

The guests gasped with amazement. When I finished there was tumultuous applause.

Bill demanded: "*How did you do it?*"

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A VINDICATION OF OUR YOUNGER READERS

Editor, AMAZING STORIES:

Let me congratulate you on "our" NEW magazine. The only familiar looking things in the last two issues are the title, the editorial page and Jules Verne's tombstone.

About the first part of this year I was almost "plumb" disgusted with AMAZING STORIES. In fact the main reason I didn't stop buying it, was because I had every issue from Vol. I, No. 1 and hated to break my set. So I stood by the ship. Both the short stories and the serials were of an inferior quality. Of course there were some good ones now and then, but they appeared much too seldom to suit me. Then came the surprising announcement of the change in the QUARTERLY. I perked and looked for changes for the better and sure enough I found them. For an issue or two the magazine remained the same. Then, beginning with the July issue, came a quite noticeable rise in the quality of the stories. And best of all: each issue is an improvement on the one before it! I haven't read the latest issue yet but from a casual inspection it seems to be very good. I believe that AMAZING STORIES is now up to the high standard that its sister magazine the QUARTERLY has been consistently maintaining since its birth. Let me say at this point that each issue of the QUARTERLY is *masterpiece*. In my opinion AMAZING STORIES QUARTERLY is without exception the best magazine containing its type of fiction to be found on the market.

If you will permit me, I would like at this point to reply to Mr. Joseph A. Vernon. Mr. Vernon speaks very heatedly of the "immature youthful prodigies" from which "most of the many letters sent in." "A boy of seventeen cannot judge matters equally as well as an intelligent person aged forty" quoth Mr. Vernon. I've been sent and not heard." I am sixteen years of age and intend to enter my freshman year at college next week. I have been a reader of AMAZING STORIES since it began and have every copy carefully stored away. Since the age of twelve I have been a scientifiction fan. I believe that the first issue I have been perfectly capable of enjoying and appreciating AMAZING STORIES—just as much so as is Mr. Vernon. Furthermore, I believe that any intelligent "kid" of seventeen (I hope I fall within that class), *can* judge matters pertaining to *scientifiction* just as well as any intelligent person aged forty. Remember, Mr. Vernon—"Out of the mouths of babes and sucklings. . . ."

Following are a list of the stories appearing during the months preceding the October issue) which I consider above the average: "Into the Green Prism," "The English At the North Pole," "The Second Deluge Bride," "Futility," "Barton's Island," "The Dimension Segregator," "Out of the Void," "The Grim Inheritance," "The Red Peril," "Gold Dust and Star Dust," and "The White Army." I am glad to see that you are going to have a three-part serial. Always more absorbing than the regular book-length serials. Also give us more long stories. As one of your correspondents says, short stories merely arouse your interest before they conclude. I believe that almost all of your best stories of the past have been serials or long stories.

Let me add my name to the list of those who want reprints (and from Discussions their name seems to be legion). By reprints, I don't mean any dry, dull, insipid, uninteresting thing like "Robur the Conqueror." For reprints I should like to see stories of the type of "Station X," "A Columbus of Space," "The First Men in the Moon," "The Moon Pool," "The Land That Time Forgot," "Treasures of Tantalus," etc.—so wonderful that no lover of scientifiction should miss them. Let me say that the aforementioned stories have not been equaled since in our magazine nor, in my opinion, ever will be. My suggestion is that you publish an Annual (in addition to your other publications), selling for fifty cents or a dollar and containing only great reprints. If this is impossible, why not devote five or ten pages every issue in the Monthly to reprints. Have such stories as "The Conquest of Mars" by Garrett Servis; "Through the Dragon Glass," by A. Merritt; "On the Brink of the Year 2000," by Garret Smith, etc. Let them run six months or a year, if necessary—but have them!

Well, I've had my say and will close by repeating the question you have been asked so much but have never answered: "What about the *promised* sequel to *The Face In The Abyss!*"

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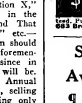

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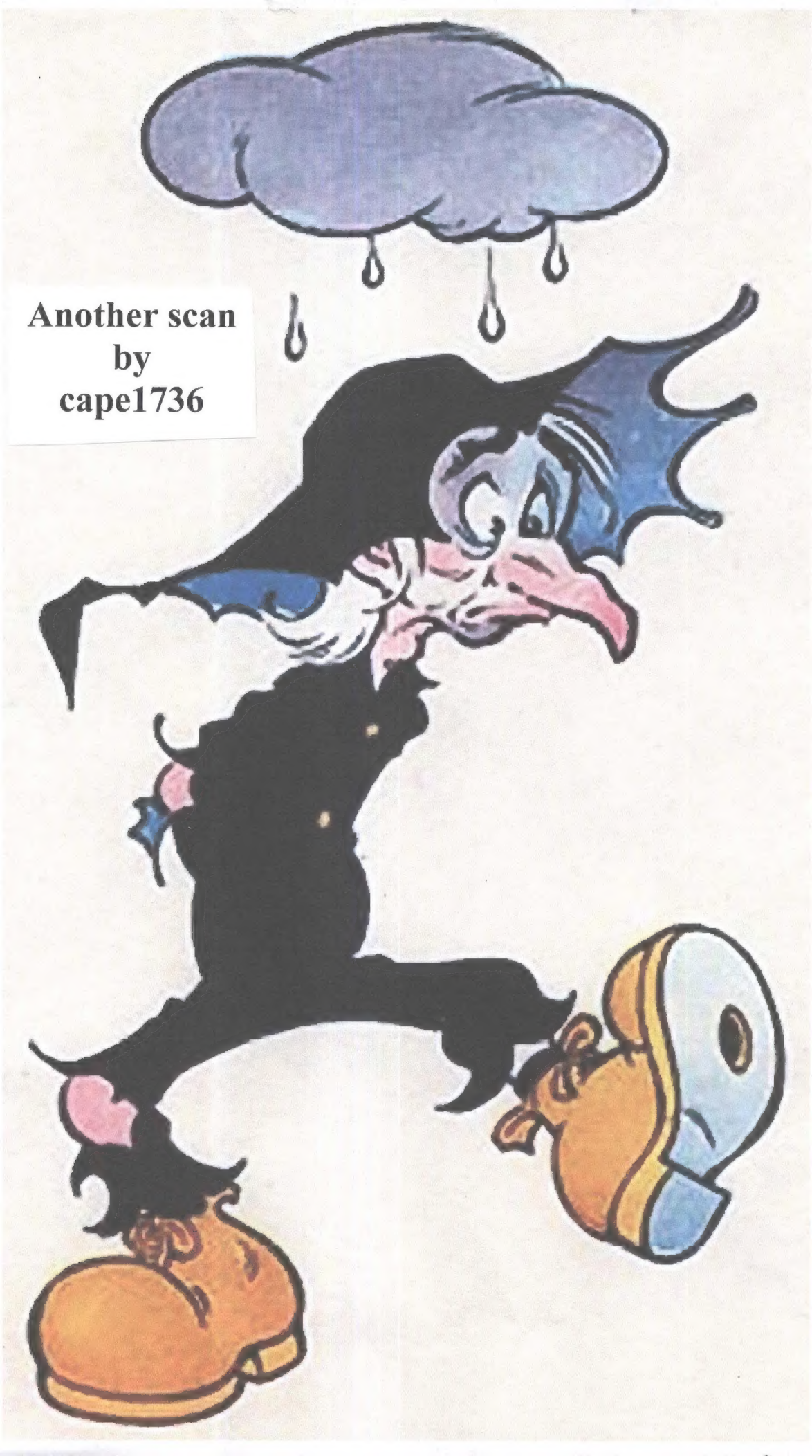
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